ASWR8150 Component Digital Switcher

Technical Guide

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Section 1

Introduction

Features and Options

The ASWR8150 offers a unique combination of small physical size and features traditionally associated with large, expensive post production switchers. The 8150 is the result of an aggressive ASIC (Application Specific Integrated Circuit) development program at Accom. Using ASIC solutions to solve traditional hardware problems has resulted in an extremely cost effective yet powerful video switcher with an expanded feature set.

The 8150 is a component digital switcher that conforms to the international component digital video standards (CCIR 601, CCIR 656, SMPTE 125M, SMPTE 259M) and switches between the 525/59.94 and 625/50 standards. Full 10-bit signal accuracy is supported for digital inputs and outputs. The 8150 can accept a variety of input signal formats via plug-in modules. These include parallel digital, serial digital, and component analog modules that support a variety of user-selectable formats.

Functionally, the 8150 has one Mix/Effect bus with two keyers and a main Program/Preset bus that incorporates a single downstream keyer with master fade-to-black. Four serial inputs are standard, as are two serial digital program outputs, a serial digital preview output, and a component analog (Y/R-Y/B-Y only) monitor output. You can configure the system with up to 16 inputs with two auxiliary outputs, or up to 14 inputs with four auxiliary outputs.

Available options include the following:

- Dual full color framestores with strobe effects capability.
- A package of seven Color Correctors—one per bus.
- An Advanced Wipe generator for the M/E and PGM/PST buses.
- Wide band 4:4:4 Chroma Keyers for use with high resolution images from computer graphics or telecines.
- An internal 1GB SCSI hard disk drive for storing effects files, personality files, engineering files, and image files.
- An internal, 10-bit, frame-based DVE board for processing video. The DVE processing includes the following features:

- SuperShadow™ – a full bandwidth drop shadow.
- SurfaceFX™ – combines the powerful texture and light source modeling tools with the advanced UltraWarp™ feature. You can use any 8150 source, including video and key inputs, the SuperMatte generator, or the Framestores, as the source for a texture.
- Four independent input freeze buffers (two for video, two for textures).
- UltraWarp™ – an advanced image warping feature.
- Channel configurations – one of the features that makes the 8150 DVE option unique is its flexible channel configuration. The main channel is dedicated for video, and the second channel can be used for video, key, or shadow. The A video transformation path is a full bandwidth video channel. The B channel can process key signals (luminance only), but is also a full bandwidth video channel. This lets the DVE board operate in three modes:

  Video + Video – you can control both video channels independently; there is no key channel in this mode.

  Video + Key – you can control the video channel and key channel independently.

  Video/Key + Shadow – you can control the combined video/key channel and the drop shadow channel independently.

System Components

The 8150 is a flexible system that you can configure to accommodate a variety of applications. Figure 1-1 shows the main system components.

Physically, the 8150 system consists of a rack mounted Signal Processor Chassis and one or more Control Panels. You can connect up to four Control Panels to a Signal Chassis on the Control Panel serial data communications chain. The Control Panel maximum chain length is 2000 feet (610 meters) for all Control Panels on the chain.

There are three LED indicators on the front of the Signal Chassis:

- Left (Green) – Lights to indicate that +5VDC from the power supply is present.
- Center (Green) – Lights to indicate that the main switcher microprocessor is running.
- Right (Amber) – Lights to indicate SCSI hard drive activity.

The main power switch is in the lower right corner of the Signal Chassis front panel, under a cover. The switch has a standard label: 0 = off, 1 = on.

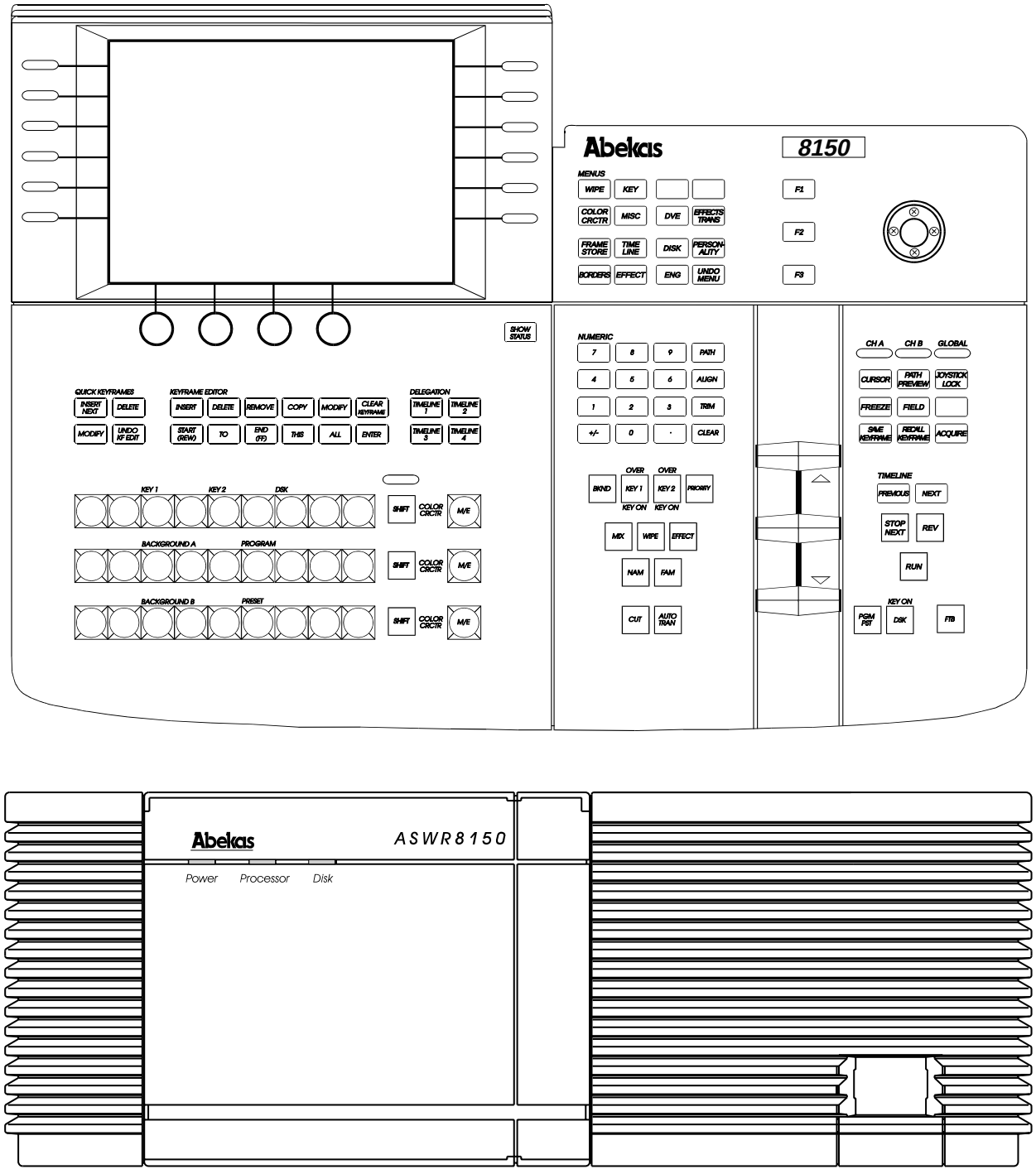


Figure 1-1 8150 System Components

Video Processing Functional Description

Video Input Modules (1)

The 8150 can accept 16 video inputs with two auxiliary outputs, or 14 video inputs with four auxiliary outputs. (Two of the four aux output paths are used for 16-input configurations.) Inputs can be any combination of video or key sources. The standard system has two Dual Serial Input modules; additional Input modules are optional. A Personality menu lets you configure input crosspoint assignments.

Figure 1-2 shows popular input module combinations. Input modules accept two inputs each. Input video formats can be dual parallel digital, dual serial digital, dual component analog (with 8-bit A to D), component analog plus key (with 10-bit A to D), or composite analog plus key (with 10-bit A to D). Both of the Component Analog Input modules accept various RGB and Y/R-Y/B-Y component formats, while the Component Analog + Key module accepts high resolution video for 4:4:4 A to D conversion.

Crosspoint Matrix (2)

An internal 32 input by 32 output crosspoint matrix routes all video sources in the 8150. A brief description of the matrix inputs and outputs appears below.

Crosspoint Matrix Inputs

The following list includes all sources available to the 8150. You can type the crosspoint input number (0-31) of any source and press the **Source Select** pushknob in several menus to directly access these sources.

External Video and Key Inputs

The system is configurable for 14 or 16 inputs. (Two auxiliary video output feeds are used for 16-input configurations.)

- INPUT 1 - 14 – User video source inputs; the crosspoint input number is the physical input number plus one, e.g., input 1 is crosspoint input number 2, input 2 is crosspoint input number 3, etc.
- INPUT 15, 16 – Additional user video source inputs; input 15 is crosspoint input number 16, and input 16 is crosspoint input number 17. (Configuring these ports as inputs excludes using them as auxiliary outputs, and vice versa.)

Mix/Effects Processor Outputs

The Mix/Effects processor provides four re-entries to the routing switcher:

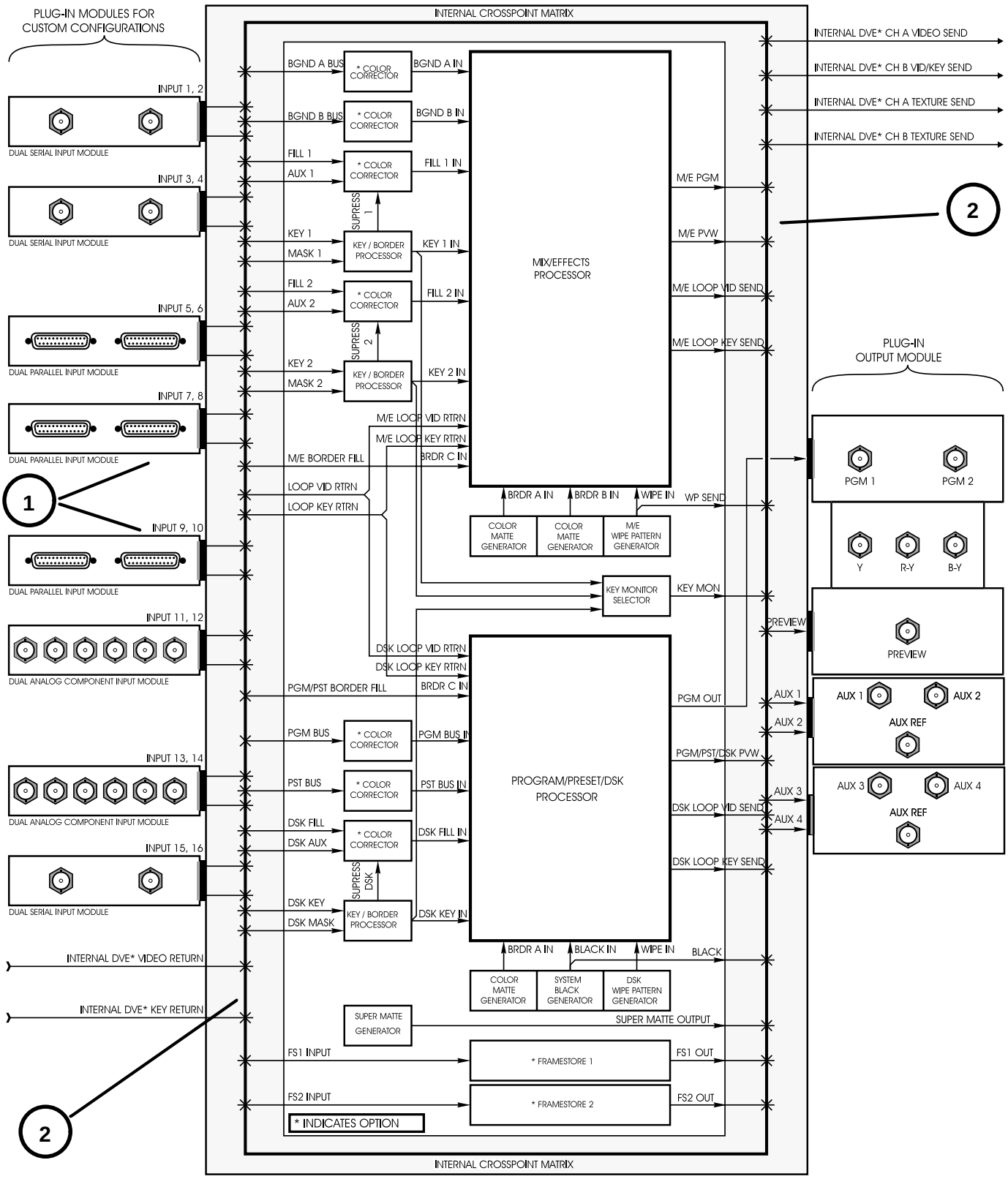


Figure 1-2 8150 Video Functional Diagram

- M/E PGM – Mix/Effect main program output; crosspoint input number 30.
- M/E PVW – Mix/Effect look-ahead preview output; crosspoint input number 31.
- M/E LOOP VID SEND – Processed fill video feed for effects looping; crosspoint input number 29.
- M/E LOOP KEY SEND – Processed key feed for effects looping; crosspoint input number 23.

Program/Preset/DSK Processor Outputs

The Program/Preset/DSK processor provides three re-entries to the routing switcher:

- DSK PVW – Program/Preset/DSK look-ahead preview output; crosspoint input number 24.
- DSK LOOP VID SEND – Processed fill video feed for effects looping; crosspoint input number 25.
- DSK LOOP KEY SEND – Processed key feed for effects looping; crosspoint input number 26.

> **NOTE: To route the main program output to an Aux bus output, select Program as the Preview Source in the Miscellaneous menu Pvw Bus Ctrl & Misc submenu, and select DSK Preview as the source for the Aux bus output.**

WIPE SEND

Wipe Pattern Send. Use the Mix/Effect or Program/Preset wipe pattern generator output as an additional key mask source; crosspoint input number 28.

KEY MON

Key Monitor. Use the selected processed key signal from the M/E or DSK key processors for monitoring or as a video source; crosspoint input number 27.

BLACK

The 8150's own internal black generator; crosspoint input number 0 or 1.

SUPER MATTE

Use the SuperMatte three color background generator output as a background, border fill, or key fill source; crosspoint input number 18.

FS 1, 2 OUT

Framestore 1 and 2 outputs, if the option is installed. Use these framestore outputs as still video or key mask sources; crosspoint input numbers 19 and 20 respectively.

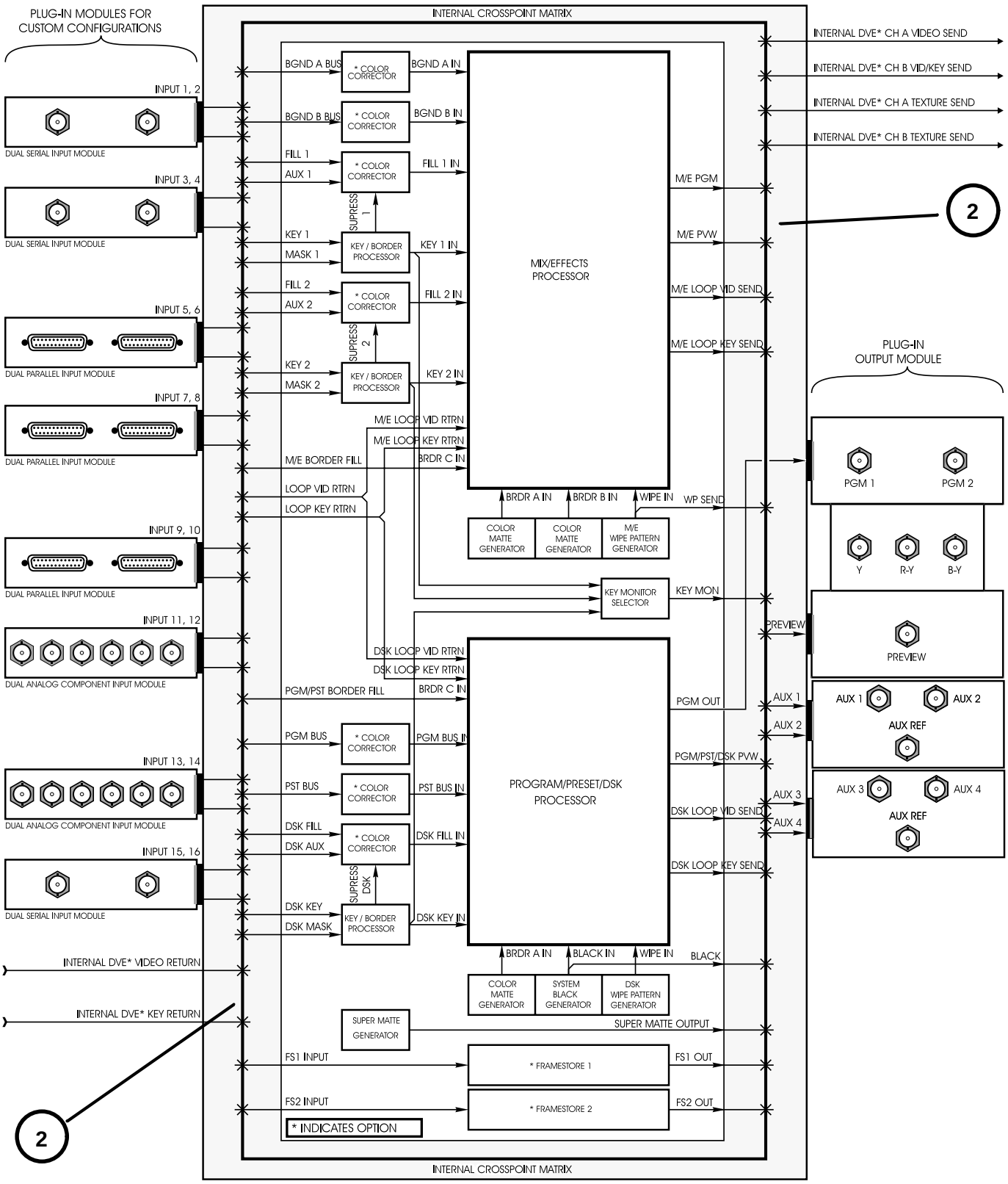


Figure 1-3 8150 Video Functional Diagram

INTERNAL DVE VIDEO RETURN
Combined channel A and B video output of the internal DVE option; crosspoint input number 21.

INTERNAL DVE KEY RETURN
Combined channel A and B key output of the internal DVE option; crosspoint input number 22.

Crosspoint Matrix Outputs

8150 Outputs

- AUX 1, 2 – Auxiliary bus outputs for external DVE effects processing or isolated video/key feeds to other equipment.
- AUX 3, 4 – Additional auxiliary bus outputs. Using these ports as auxiliary outputs excludes using them as inputs 15 and 16, and vice versa.
- MAIN PVW – The feed to the 8150 preview output.

Internal Destinations

- BKGND A (Background A) – The video source selected on the Mix/Effect Background A bus.
- BKGND B (Background B) – The video source selected on the Mix/Effect Background B bus.
- FILL 1 – The 4:2:2 fill source selected for M/E keyer 1.
- M/E KEY 1 AUX – The 0:2:2 part of a 4:4:4 fill source selected for M/E keyer 1 if the 4:4:4 Chroma Key option is installed.
- KEY 1 – The key source selected for M/E keyer 1.
- MASK – The mask source selected for M/E keyer 1; also used as the 0:2:2 part of the key feed if the 4:4:4 Chroma key option is installed.
- FILL 2 – The 4:2:2 fill source selected for M/E keyer 2.
- M/E KEY 2 AUX – The 0:2:2 part of a 4:4:4 fill source selected for M/E keyer 2 if the 4:4:4 Chroma Key option is installed.
- KEY 2 – The key source selected for M/E keyer 2.
- MASK 2 – The mask source selected for M/E keyer 2; also used as the 0:2:2 part of the key feed if the 4:4:4 Chroma key option is installed.
- M/E BORDER FILL – The fill source for an M/E wipe border or keyer border.
- LOOP VID RTRN (Loop Video Return) – The dedicated video return path provided for internal or external effects looping. This output feeds both the M/E and PGM/PST processors.
- LOOP KEY RTRN (Loop Key Return) – The dedicated key return path provided for internal or external effects looping. This output feeds both the M/E and the PGM/PST processors.

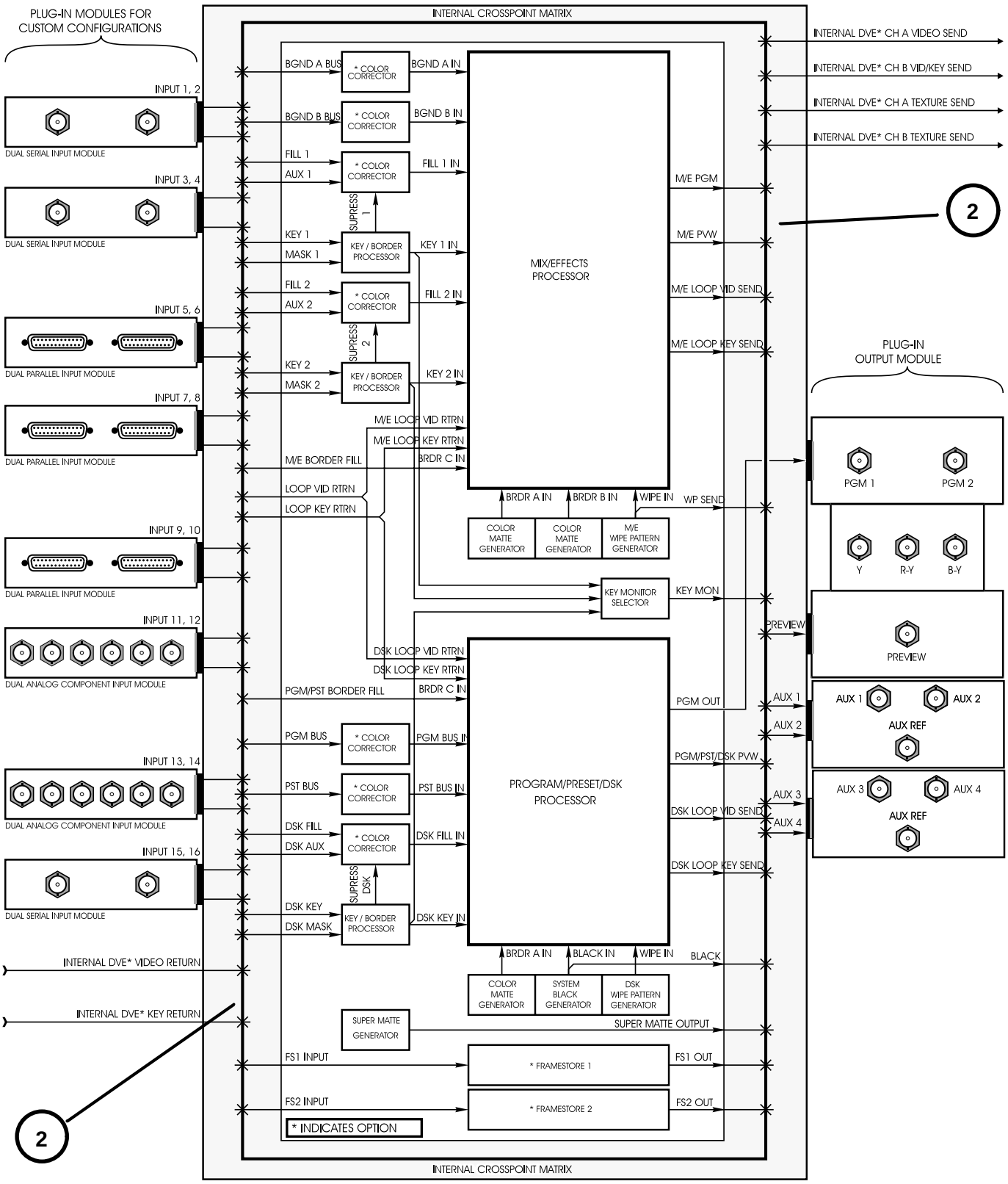


Figure 1-4 8150 Video Functional Diagram

- DSK BORDER FILL – The fill source for a PGM/PST wipe border or DSK border.
- PGM (Program) – The source selected on the Program bus.
- PST (Preset) – The source selected on the Preset bus.
- DSK FILL – The 4:2:2 fill source selected for the DSK.
- DSK AUX – The 0:2:2 part of a 4:4:4 fill source selected for the DSK if the 4:4:4 Chroma Key option is installed.
- DSK KEY – The key source selected for the DSK.
- DSK MASK – The mask source selected for the DSK; also used as the 0:2:2 part of the key feed if the 4:4:4 Chroma key option is installed.
- FS 1,2 IN – The video sources selected as the framestore inputs.
- INTERNAL DVE CH A VIDEO SEND – The source selected for channel A of the internal DVE option. This source is always a full color video signal.
- INTERNAL DVE CH B VID/KEY SEND – The source selected for channel B of the internal DVE option. This source can be either a full color video signal for Video/Video mode or a monochrome key signal for Video/Key and Video-Key/Shadow modes.
- INTERNAL DVE CH A TEXTURE SEND – The source selected as the SurfaceFX™ texture input for channel A of the internal DVE option. This source can be either a full color or monochrome video signal.
- INTERNAL DVE CH B TEXTURE SEND – The source selected as the SurfaceFX™ texture input for channel B of the internal DVE option. This source can be either a full color or monochrome video signal.

Color Corrector (3)

There are seven available Color Corrector options, one for each bus row: Background A, Background B, Fill 1, Fill 2, Program, Preset, and DSK Fill.

The color correctors let you make adjustments in either YUV or RGB color space. YUV video input at the standard 4:2:2 sample ratio can be upsampled to 4:4:4, then transcoded into RGB to provide true RGB color correction; also, YUV sampled at 4:4:4 is directly transcoded to RGB. In either case, after correction, the video is transcoded, downsampled, and output as YUV 4:2:2 video.

With the 4:4:4 Chroma Key option, you can input key fill signals (Fill 1, Fill 2, and DSK Fill) to the 8150 by using two standard 4:2:2 inputs, processing them at the 4:4:4 sample rate directly. The normal color corrector fill video input handles the 4:2:2 part of the 4:4:4 signal. The Aux color corrector input handles the 0:2:2 part. This complements optional 4:4:4 chroma key extraction in the Key processor, which uses

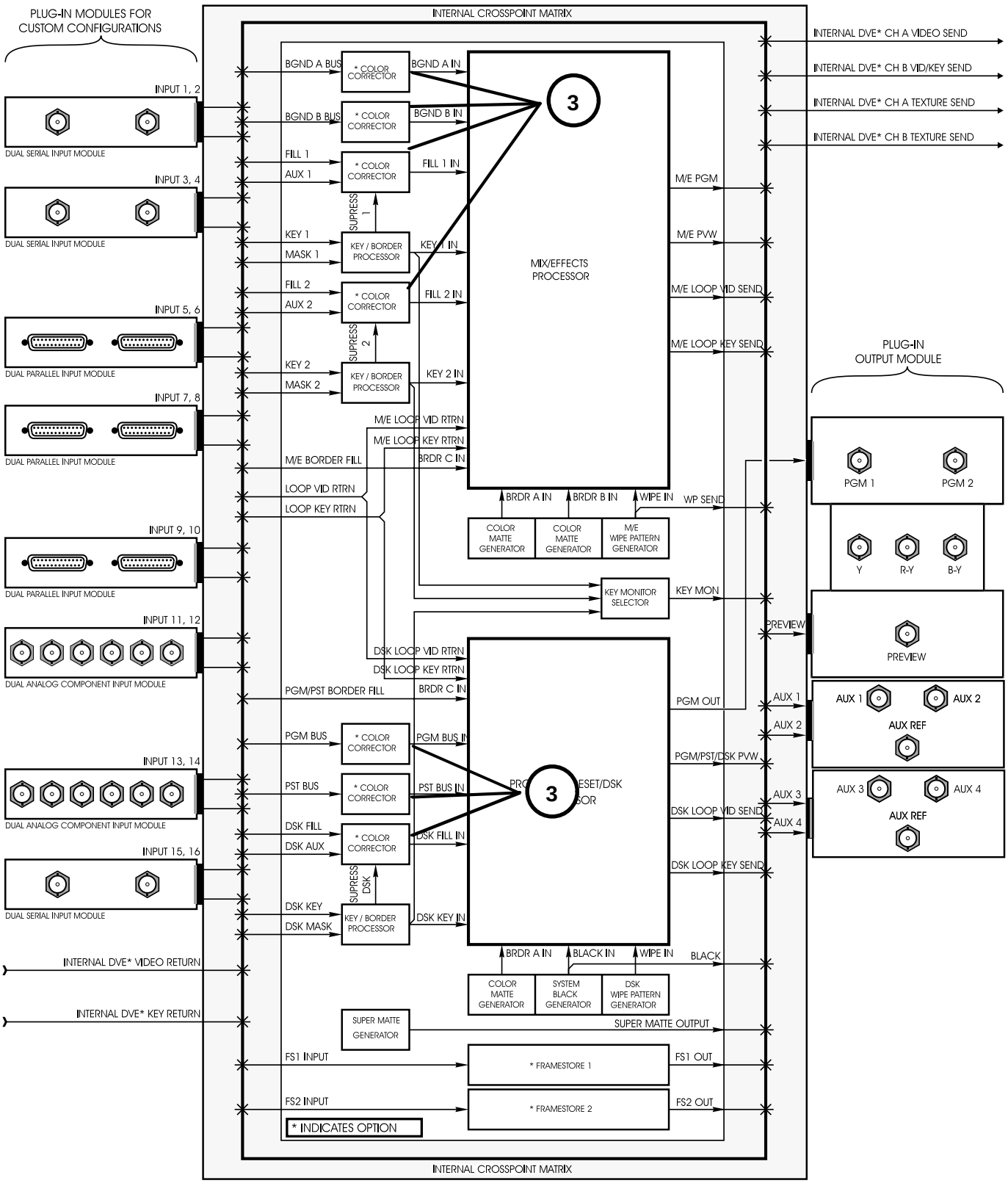


Figure 1-5 8150 Video Functional Diagram

the main key input for the 4:2:2 part and the external mask input for the 0:2:2 part. After you complete the color correction, the video is downsampled and output as 4:2:2 video.

Key/Border Processor (4)

Inputs

The Key/Border processors have a primary key extraction input (Key 1, Key 2, and DSK Key) and an external mask input (Mask 1, Mask 2, and DSK Mask). Selecting the optional 4:4:4 chroma key extraction mode provides the external mask input with an additional sample resolution path (4:2:2 + 0:2:2 = 4:4:4).

Outputs

The Key and Border processors have an extracted key output that feeds their respective Mix/Effect or DSK keyer (Key 1, Key 2, DSK), and an associated suppression signal that feeds the optional Color Corrector (Suppress 1, Suppress 2, Suppress DSK).

Key Processing

All keyers are identical, and offer luminance and chroma key extraction.

Chroma Key Extraction

The 8150 features advanced chroma key modes, including 4:2:2 and optional 4:4:4 high bandwidth modes. Conventional chroma key controls appear on the left in Figure 1-6, below. The 8150 has advanced chroma key circuitry that lets you precisely define the boundaries of the chroma key. These advanced chroma key controls appear on the right

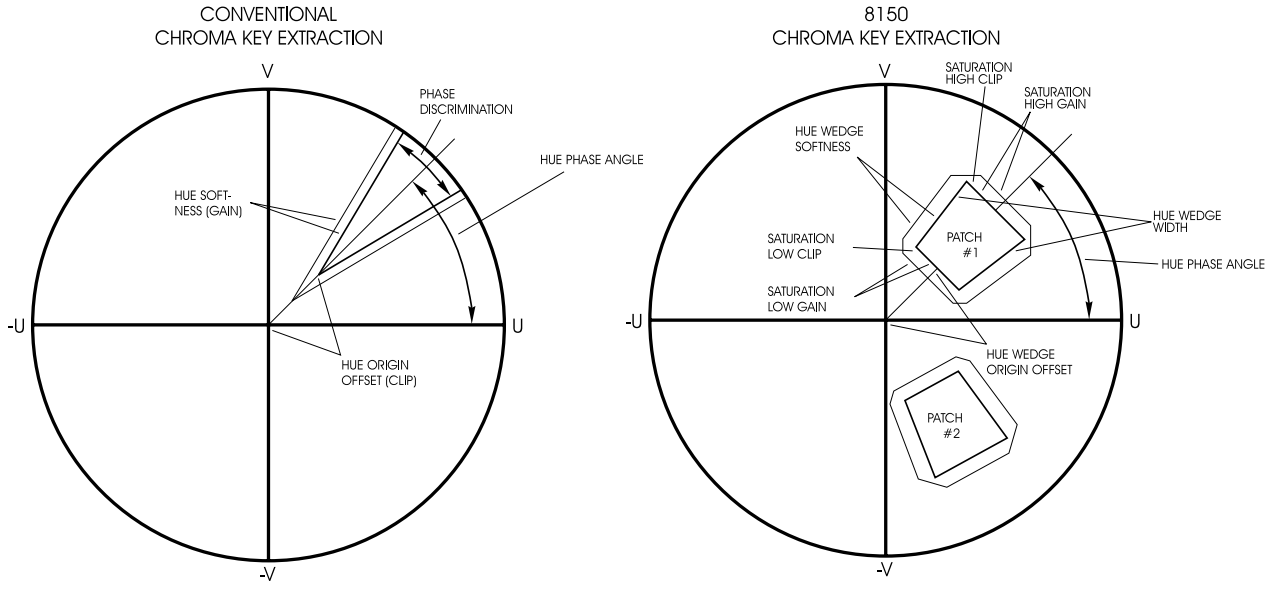


Figure 1-6 Conventional vs. 8150 Chroma Key Extraction

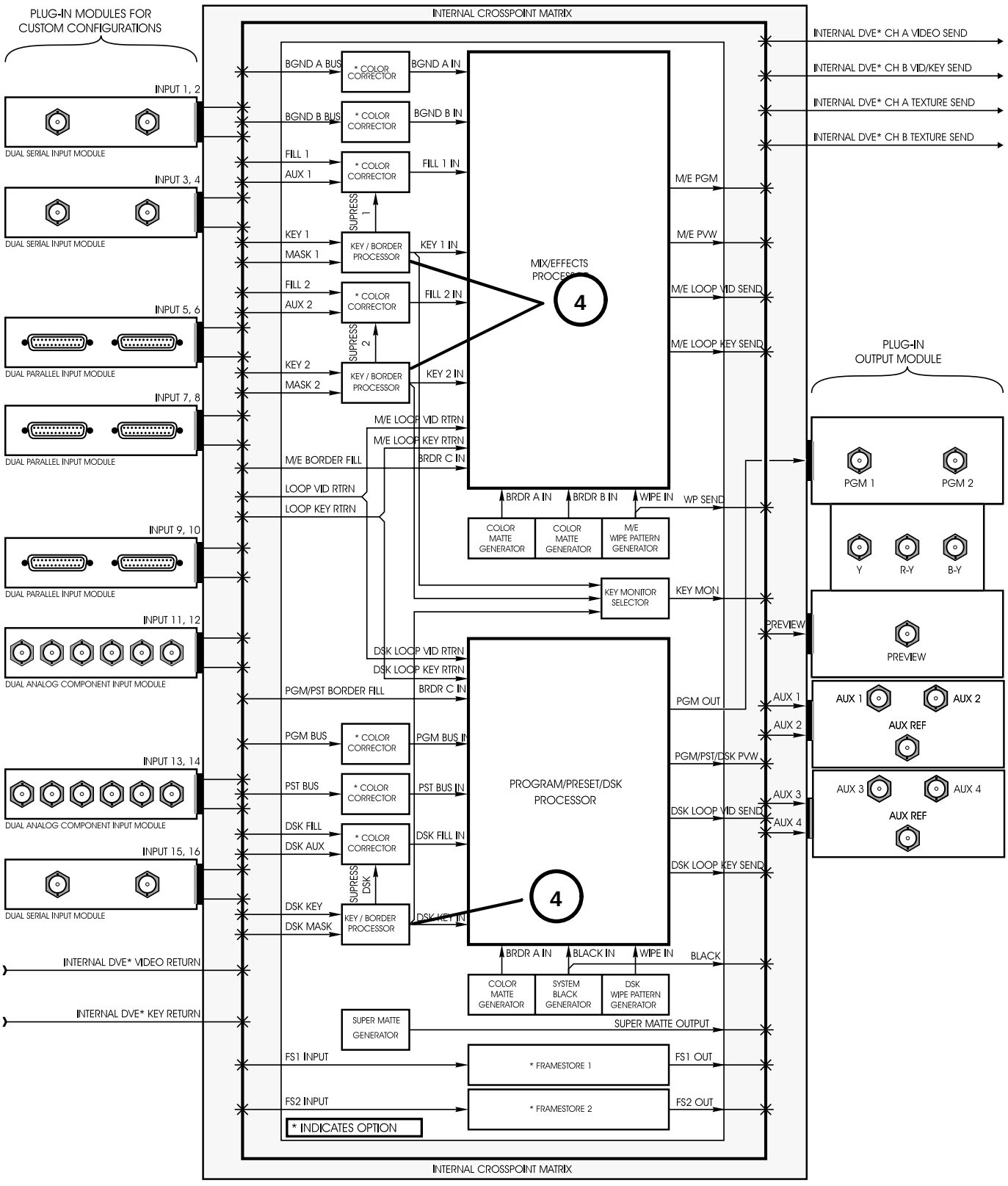


Figure 1-7 8150 Video Functional Diagram

in Figure 1-6. Dual patch mode discriminates and combines two phase vectors; each patch has controls for adjusting the chroma key settings precisely.

Luminance Key Extraction
Advanced clip and gain controls support fully linear luminance key extraction. The **Low Clip** and **Low Gain** pushknobs are like the Clip and Gain controls in a traditional keyer, letting you change the key signal low level clip point and slope. The **High Clip** and **High Gain** pushknobs, however, let you change the key signal high level clip point and slope.

Key Modifiers

Masking
The 8150 supports both internal and external masking. Internal box mask controls include position, size, and rotation angle. You can select external mask sources from the internal crosspoint matrix. You can use the mask to hide parts of the key or to expose additional parts of the key.

Key Signal Transformations
Extracted key adjustments include size, position, and defocus in both the horizontal and vertical dimensions.

Border Processing

Keys can have the following types of borders: full surround, outline only, embossed, extruded, trailing, and drop shadow. You can soften any border type. You can also soften extruded, trailing/decaying, and drop shadow borders independently of the original key signal.

Color Matte Generators (5)

Three full field color matte generators can provide key matte, key border, or wipe border fills. Two color matte generators are dedicated to the Mix/Effects processor; one is dedicated to the PGM/PST/DSK processor.

Super Matte Generator (6)

The SuperMatte generator can create three-color washes in a variety of patterns, using a dedicated wipe pattern generator. The SuperMatte generator feeds the internal crosspoint matrix for video source assignment in the 8150.

Black Generator (7)

The black generator feeds the fade-to-black circuitry in the PGM/PST/DSK processor, and the internal crosspoint matrix as system black.

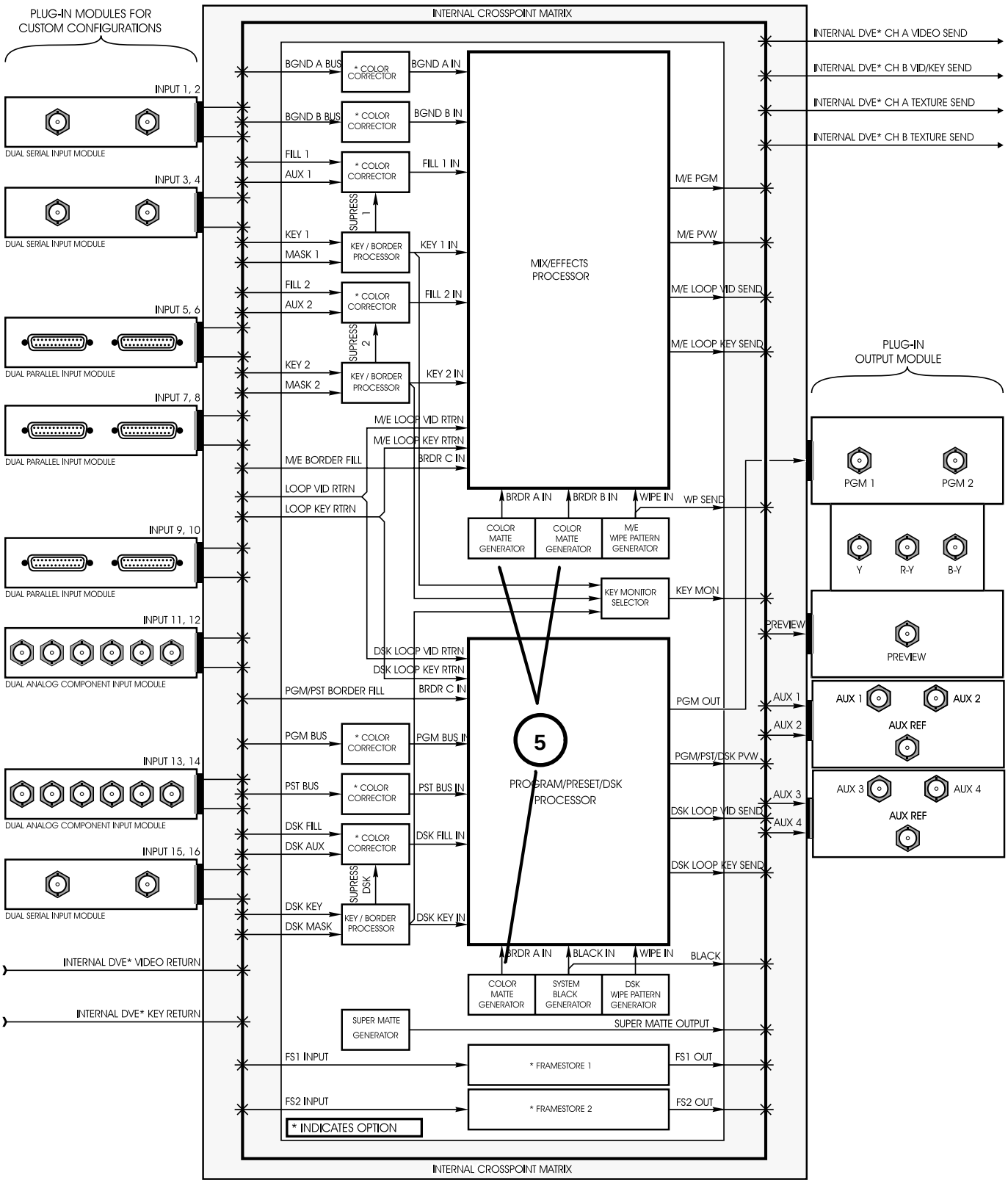


Figure 1-8 8150 Video Functional Diagram

Wipe Pattern Generators (8)

Two independent wipe pattern generators provide wipe transitions for the Mix/Effects processor and the PGM/PST/DSK processor. Either wipe generator can be fed to the routing switcher and output for use as a mask source.

The standard wipe generators offer 28 patterns. Wipe pattern controls include aspect ratio, softness, softness symmetry, position, and rotation. Wipe border controls include width, opacity, and fill source selection.

The optional Advanced Wipe generator provides 65 additional wipe patterns, plus matrix wipes, pattern multiplication, pattern modulation, and pattern morphing for the M/E wipes. The Advanced Wipe generator replaces both of the standard wipe generators, as well as adding some of the same features to the SuperMatte generator.

Framestores (9)

Two optional 10-bit full bandwidth framestores can be used to freeze video, key, or mask signals. Each has strobe freeze with variable duty cycle, and has independent settings for field 1, field 2, or frame freeze output. The framestores also provide internal test patterns that you can route anywhere within or outside the 8150.

You can also save and recall framestore images to and from the floppy disk drive or the optional internal SCSI hard disk drive.

Key Monitor Selector (10)

The Key Monitor selector lets you view the processed key signal of any of the three keyers. The label above the Key Fill bus row indicates which processed key signal you are outputting. You can toggle the Key Bus Delegation button (the green oblong button above the **SHIFT** buttons) to select the processed key signal of any keyer.

Mix/Effect Processor (11)

The Mix/Effect processor architecture is very flexible. The processing blocks consist of a mixer, two keyers, and an internal video routing bus. You can transition keyer priority freely. Mixer transition types include mix, wipe, non additive mix (NAM), and full additive mix (FAM). The M/E processor also lets you break out processed key and fill signals, route them to external devices for further manipulation, and return them to the M/E processor, before the final compositing.

PGM/PST /DSK Processor (12)

The PGM/PST mixer transition capabilities are identical to the Mix/Effects processor, except that it has one active keyer instead of two.

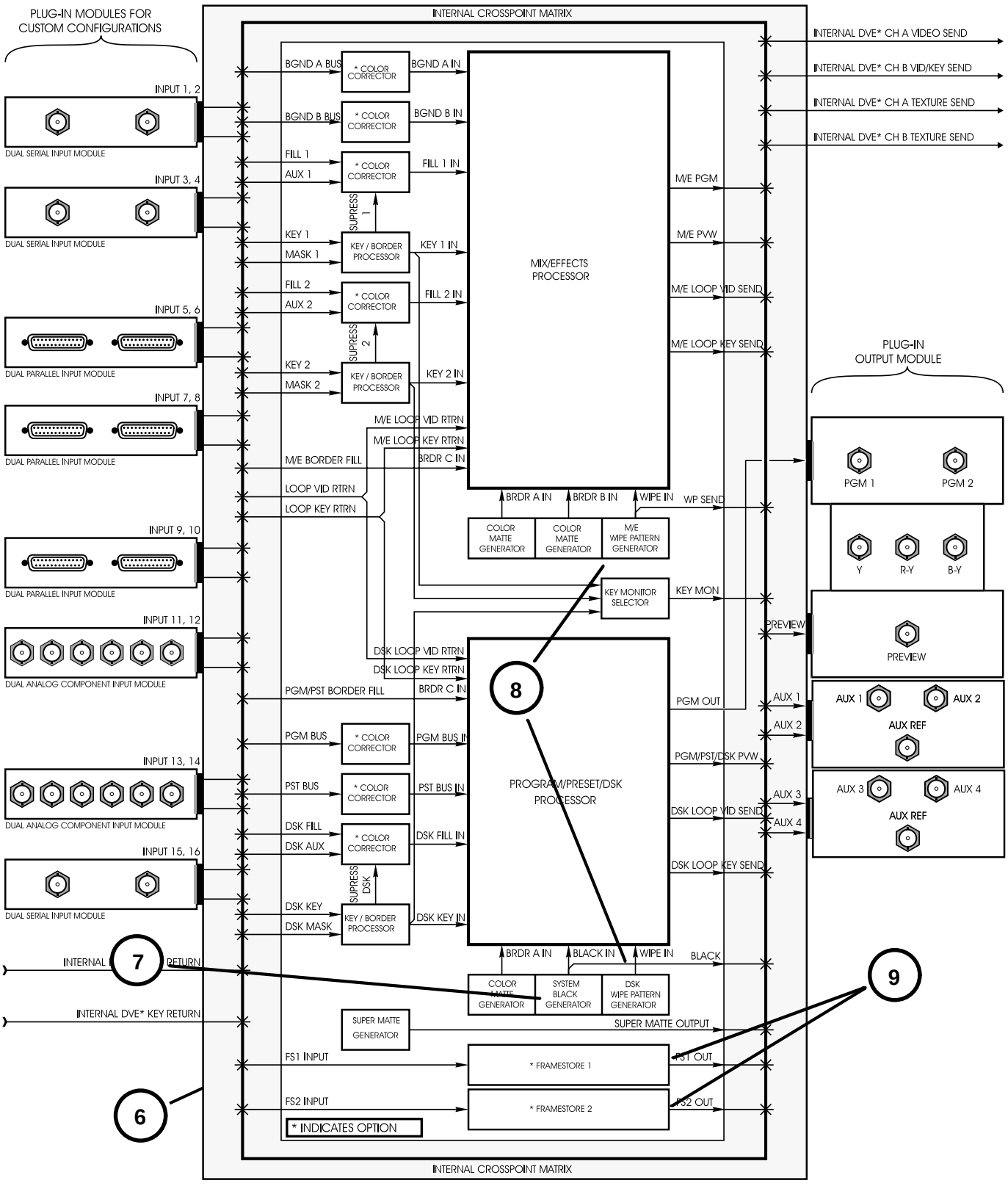


Figure 1-9 8150 Video Functional Diagram

The processing flow consists of a PGM/PST mixer, a downstream keyer, and a master fade-to-black mixer. Like the M/E processor, the PGM/PST/DSK processor lets you to break out processed key and fill signals, route them to external devices for further manipulation, then return them before the final compositing.

Standard Output Module (13)

The standard Output module may be installed in some 8100s and 8150s that have been upgraded from 8100s. It processes signal outputs as follows.

Auxiliary Outputs (Optional)

Aux 1, 2

The Video Output module has two serial digital auxiliary bus outputs for external processing feeds or for isolated feeds. These outputs are always cotimed, and are delayed two lines, 18 lines, or 34 lines from reference, depending on the source selected. The output connectors are always present, whether the option is installed or not.

Auxiliary Reference (Aux Ref)

The Aux Ref feed is a variably-delayed analog composite sync signal that provides locking reference for video devices (typically DVEs) fed by Aux bus outputs 1 and 2, because of their inherent delay from house reference. Aux bus output timing varies according to the source selected for the output, and Aux Ref is always zero timed to Aux 1 and 2. See Section 6 – System Timing for more information.

Component Analog Monitor Outputs

Y, R-Y, B-Y

You can select this monitor feed as program or preview video. This output is in the SMPTE/EBU N10 component analog video format (700 mVp-p video with 300 mVp-p sync on Y).

> **NOTE: This output is intended for monitoring only and is not recommended for program distribution or recording.**

Program Outputs

The standard Output module provides two identical serial digital program outputs. Each has a fixed delay from reference of 34 lines plus approximately 5 microseconds.

Preview Output

The standard Output module provides one serial digital preview output. It has a fixed delay from reference of 34 lines plus approximately 5 microseconds.

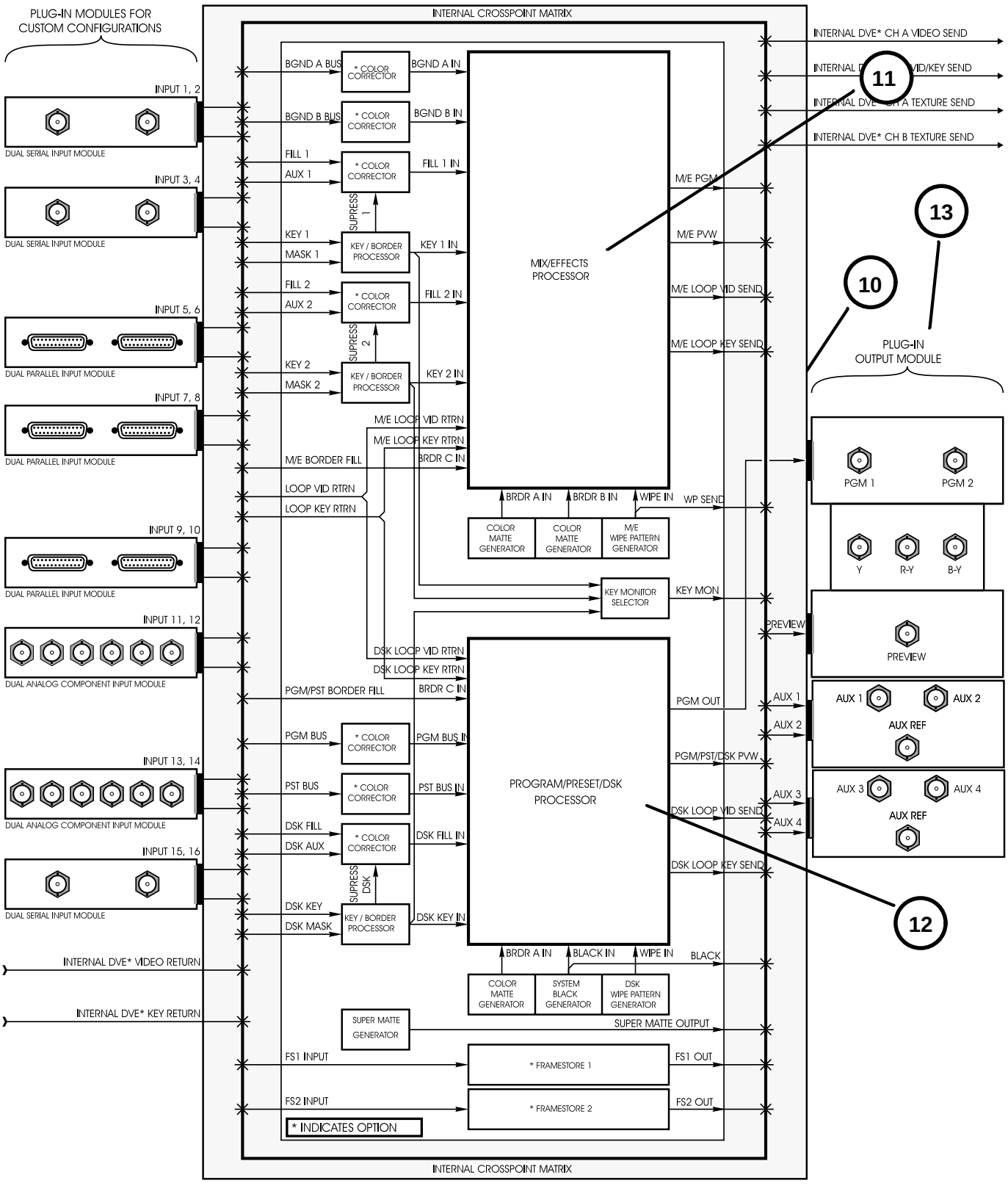


Figure 1-10 8150 Video Functional Diagram

Enhanced (Frame Delay) Output Module (13)

The Enhanced Output module may be installed in some 8100s and is installed in all 8150s, with the possible exception of those 8150s that were upgraded from 8100s. It processes signal outputs as follows.

Auxiliary Outputs (Optional)

Aux 1, 2

The Frame Delay Output module has two serial digital auxiliary bus outputs for external processing feeds or for isolated feeds. These outputs are always cotimed, and are delayed two lines, 18 lines, or 34 lines from reference, depending on the source selected. You can also select a one frame delay so that you can re-enter and retime these outputs back into your video system. The output connectors are always present, whether the option is installed or not.

Auxiliary Reference (Aux Ref)

The Aux Ref feed is a variably-delayed analog composite sync signal that provides locking reference for video devices (typically DVEs) fed by Aux bus outputs 1 and 2. Aux bus output timing varies according to the source selected for the output, and Aux Ref is always zero timed to Aux 1 and 2. See Section 6 – System Timing for more information.

Component Analog Monitor Outputs

Y, R-Y, B-Y

You can select this monitor feed as Preview, Program 1, or Program 2 video. Its timing (34-line or frame delay) follows the settings for the output selected for it. This output is in the SMPTE/EBU N10 component analog video format (700 mVp-p video with 300 mVp-p sync on Y).

> **NOTE: This output is intended for monitoring only and is not recommended for program distribution or recording.**

Program Outputs

The optional Output module provides two serial digital program outputs that have identical video content but different output timing. The Program 1 output delay from reference is selectable between one frame for normal use and 34 lines plus approximately 5 microseconds for use during preread operations with component digital VTRs. The Program 2 output has a fixed delay of one frame.

Preview Output

The optional Output module provides one serial digital preview output. It has a delay from reference that is switchable. You can set it to 34 lines plus approximately 5 microseconds for preread operations, or to one frame delay for normal operations.

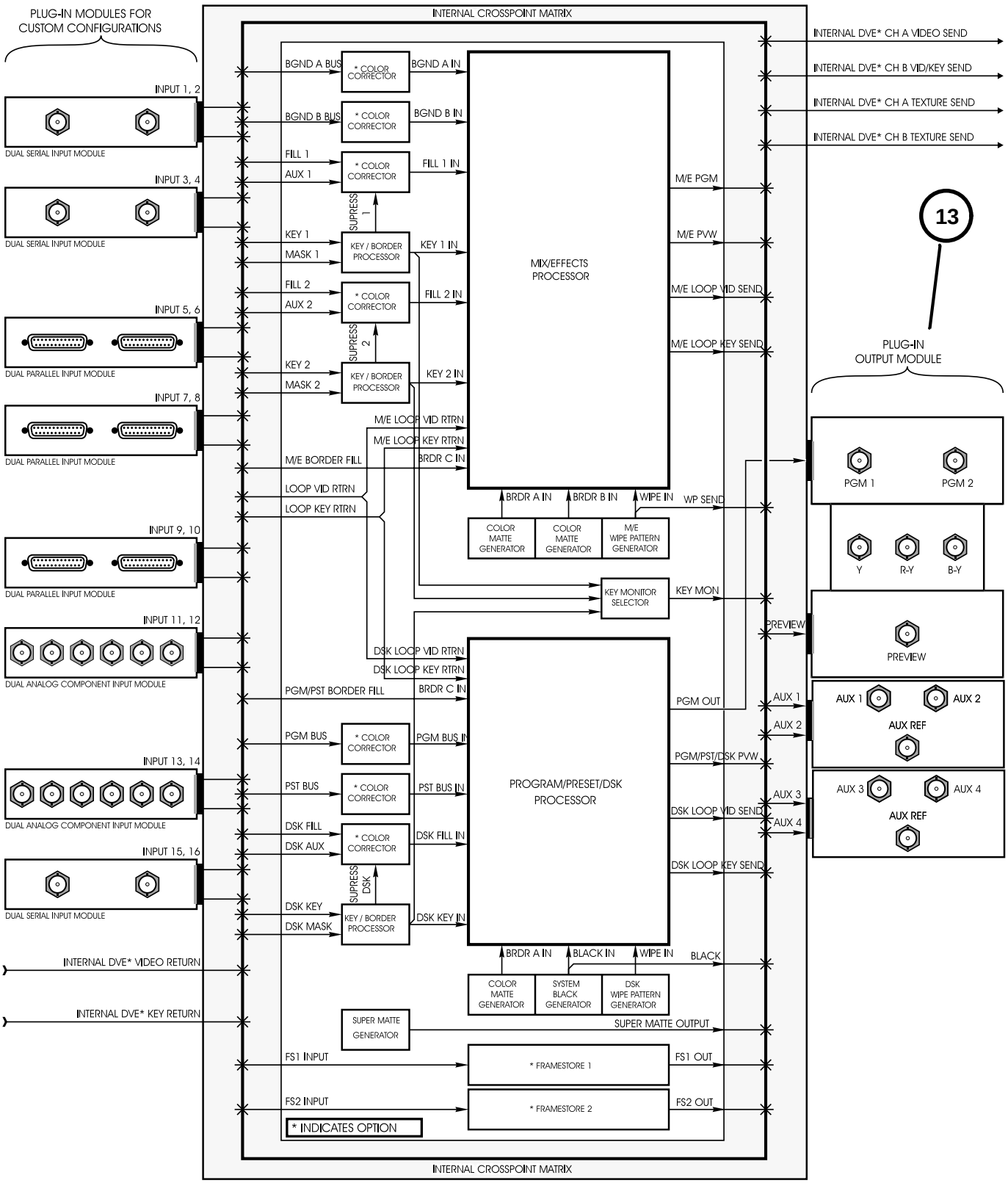


Figure 1-11 8150 Video Functional Diagram

Auxiliary 3 and 4 Outputs (Optional)

Aux 3, 4

The Aux 3 and 4 Output module, if present, is installed in the lower right input slot at the rear of the chassis. This module has two additional serial digital auxiliary bus outputs for external processing feeds or for isolated feeds. These outputs are always cotimed, and are delayed two lines, 18 lines, or 34 lines from reference, depending on the source selected; they cannot be delayed by a full frame. Their timing is normally independent of the Aux 1 and 2 outputs, but you can zero- time them to Aux 1 and 2 (unless Aux 1 and 2 are set to frame delay) by switching the Combiner setting On in the Engineering Input submenu.

Aux Ref

The Aux Ref feed is a variably-delayed analog composite sync signal that provides locking reference for video devices (typically DVEs) fed by auxiliary bus outputs 3 and 4. Aux bus output timing varies according to the source selected for the output, and this Aux Ref output is always zero timed to Aux 3 and 4. See Section 6 – System Timing for more information.

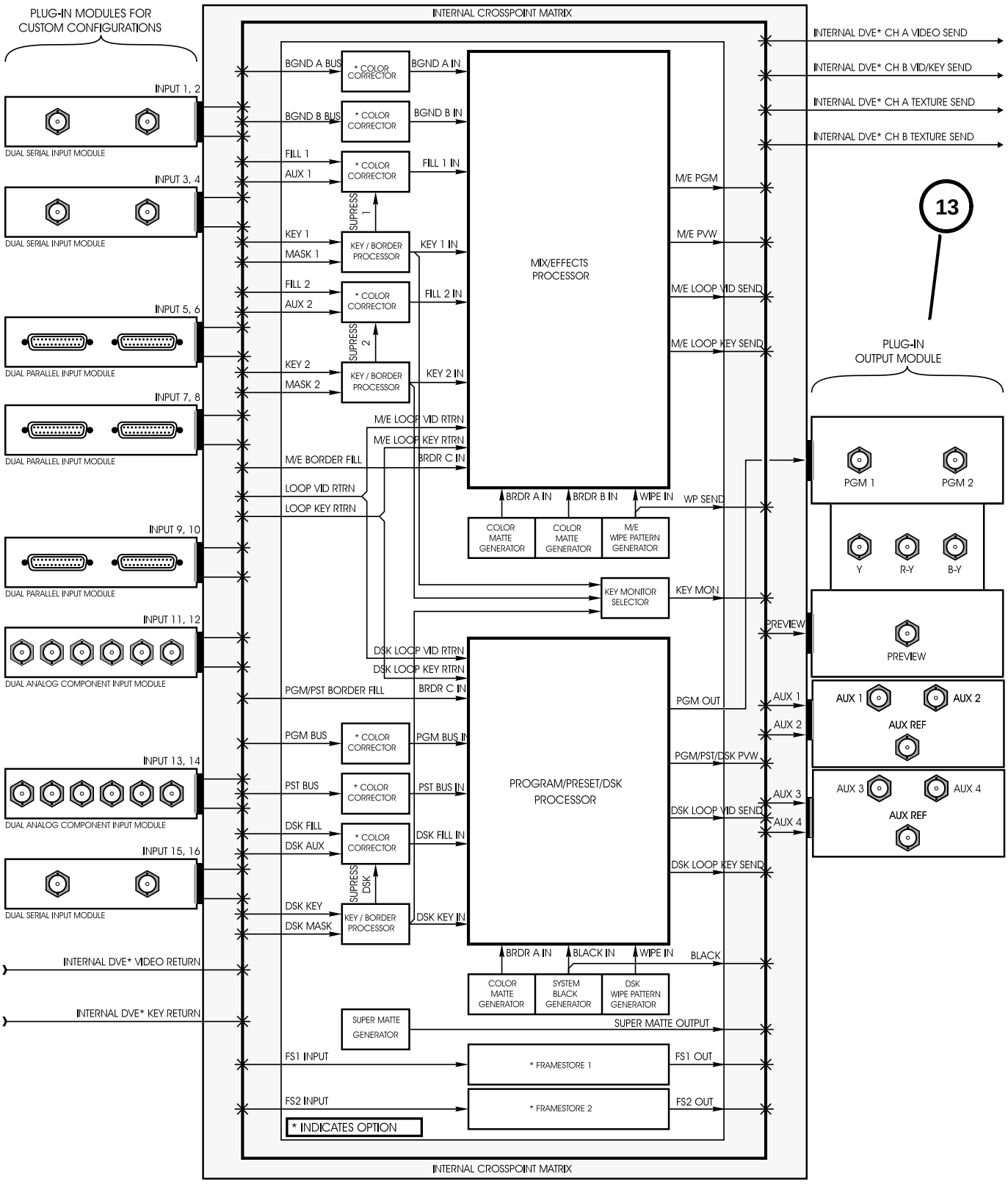


Figure 1-12 8150 Video Functional Diagram

Control Functional Description

Signal Chassis

Serial 1, 2, 3

Three serial remote control ports provide interfaces to external devices, primarily edit controllers. Figure 1-13, on the facing page, shows the typical configuration for connecting the 8150 to an edit controller. Use ports 1 and 2 for edit control, and configure them for crosspoint or timeline protocols. Use the third serial port for LINC™ devices, or other types of controllers. You can set each serial port independently for connection type (e.g. master or slave RS-422), communication protocol, baud rate, and parity.

Control Panel

This serial control port connects the 8150 Signal Chassis to the Control Panel chain. You can connect up to four Control Panels to a Signal Chassis using standard RS-422 cables. The Control Panel maximum chain length is 2000 feet (610 meters) for all Control Panels on the chain.

GPI (General Purpose Interface)

This port supports eight inputs and eight outputs. GPI inputs trigger a variety of functions, as assigned in the Personality menu. GPI outputs are programmed as keyframe functions in a Timeline effect.

Tally

Sixteen input source tally connections are provided through opto-isolated open collector outputs.

Control Panel

Control In

This serial port connects the Control Panel to the Signal Chassis control chain.

Control Out

This serial port connects additional Control Panels to the Signal Chassis control chain. You can connect up to four Control Panels to the Signal Chassis control chain using standard RS-422 cables. The Control Panel maximum chain length is 2000 feet (610 meters) for all Control Panels on the chain.

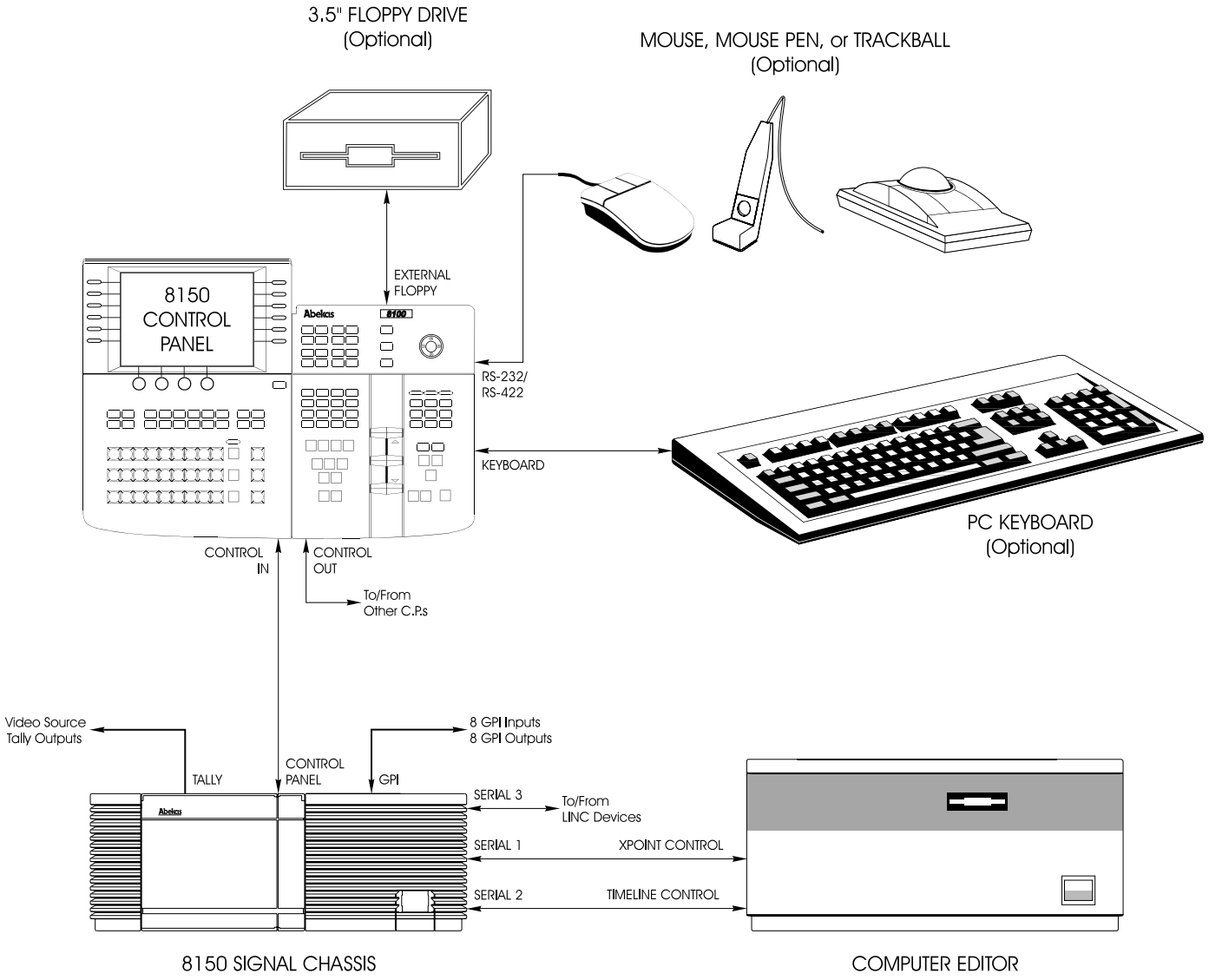


Figure 1-13 8150 Control Functional Diagram

RS-232

This serial port connects a mouse, mouse pen, or trackball for fine control of wipe pattern position and other joystick functions.

RS-422

This serial port is not currently supported.

Keyboard

You can connect an off-the-shelf, PC AT keyboard to this port for naming crosspoints and disk files.

External Floppy

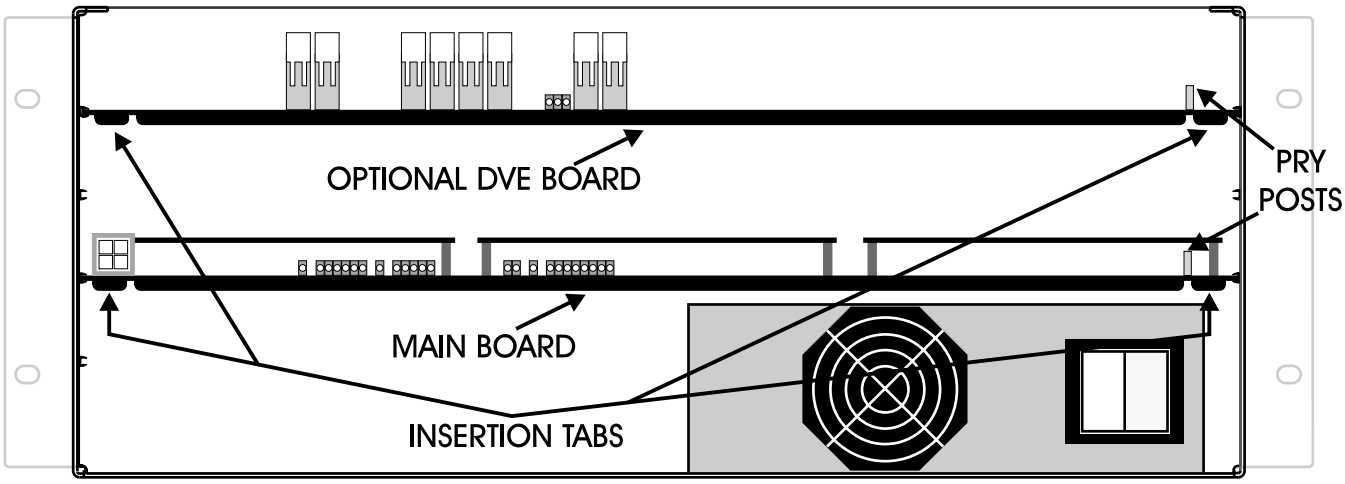
This port connects an external 3.5" 1.44MB floppy disk drive. You will need this drive if you mount the Control Panel in a console that covers the built-in disk drive.

!!! IMPORTANT NOTICE !!!

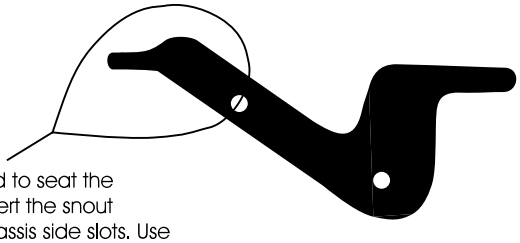
Use the Abekas supplied insertion/extraction tool
to remove or install the 8150 Main board or DVE board in the Signal Chassis.
See the instructions below.

Removing the Main board disconnects the RAM battery backup. Save all effects, personality files, and engineering setups to disk before extracting the board.

ASWR8150 - SIGNAL CHASSIS FRONT INTERNAL VIEW

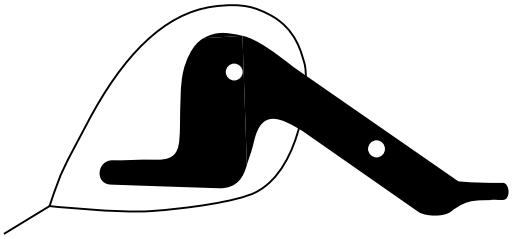


Insertion Instructions



Use this end to seat the boards: insert the snout into the chassis side slots. Use the tool head against the insertion tabs to wedge the board into its socket.

Extraction Instructions



Use this end to lever the boards from their sockets: using the hole in the fat part of the tool, slip the tool over the pry post on the right side of the board. Extract the board by pulling outward on the tool handle.

Good Practices

Electronic equipment requires special handling. When maintaining the equipment covered in this manual, observe the standard procedures listed below:

- Unless it's terminated internally, use the correct termination resistor at the input of any monitoring device when connecting it to a high frequency output.
- Always turn power OFF before removing or installing circuit boards, fuses, cable connectors, etc. After powering down, wait for the power supplies to bleed down before reinstalling circuit boards.
- When troubleshooting, sometimes removing an I.C. from its socket and reseating it solves the problem. Also try cleaning the board and rechecking the device before assuming it has failed.
- MOS and other devices are sensitive to static electricity and may be damaged by static discharge. Observe static precautions when handling any electronic components or assemblies. Use only a soldering iron with a grounded tip when soldering components.
- Take care not to damage the circuit board traces when removing components.
- Wear safety glasses when working on high voltage circuits.

The AC line circuit breaker protects the hot side of the line only. There is no protection on the neutral leg. Therefore, single phase power is required.

240 Volt Users

The power cord supplied with this equipment has a molded grounding connector (IEC 320-C13) at one end and stripped conductors (50/5 mm) at the other end. The conductors are CEE color coded:

Light Blue..... Neutral

Brown..... Line

Green/Yellow ..... Ground

Other IEC 320 type power supply cords can be used if they comply with the safety regulations of the country in which they are installed.

Section 2

Installation

Unpacking

Remove the 8150 Signal Chassis, Control Panel, and other equipment from the shipping boxes. Inspect all articles for shipping damage. If you find any, notify the shipping carrier immediately for claims adjustments.

Compare the contents against the packing list. Contact your Accom sales representative if you find unexplained shortages.

Pre-Installation Checks

Signal Chassis

Remove the front cover and ensure the internal circuit board(s) is seated in the Motherboard. Carefully inspect the Signal Chassis to ensure that no parts were dislodged during shipping.

Control Panel

Carefully inspect the Control Panel to ensure that all buttons and knobs are installed and secure.

Power Consumption

Signal Chassis

The 8150 Signal Chassis consumes less than 900 watts. Plug the 8150 into a standard AC mains outlet.

Voltage Selection

The 8150 power supply automatically adapts to the line voltage and frequency supplied (90 - 264 VAC, 47 - 63 Hz).

Control Panel

The 8150 Control Panel consumes less than 55 watts. An external modular power supply provides Control Panel operating voltages. Plug the Control Panel power supply into a standard AC mains outlet, then connect the DC power cable to the Control Panel "POWER" connector. The DC power cable is approximately six feet (two meters) long.

Voltage Selection

The Control Panel power supply automatically adapts to the line voltage and frequency supplied (90 - 260 VAC, 50 - 60 Hz).

Cooling and Airflow

Signal Chassis

The 8150 dissipates less than 900 thermal watts. Four fans, two internally mounted and two mounted at the chassis rear, draw air through the front cover, over the circuitry, and out the chassis rear. Figure 2-1, below, shows the air flow direction. Allow at least six inches (152mm) at the chassis rear for ventilation.

> **NOTE: All eight input module locations must have either a module or a blank plate installed for proper cooling air flow inside the chassis.**

Control Panel

The 8150 Control Panel does not require special cooling considerations. Ensure that the Control Panel modular power supply has adequate clearance for proper ventilation.

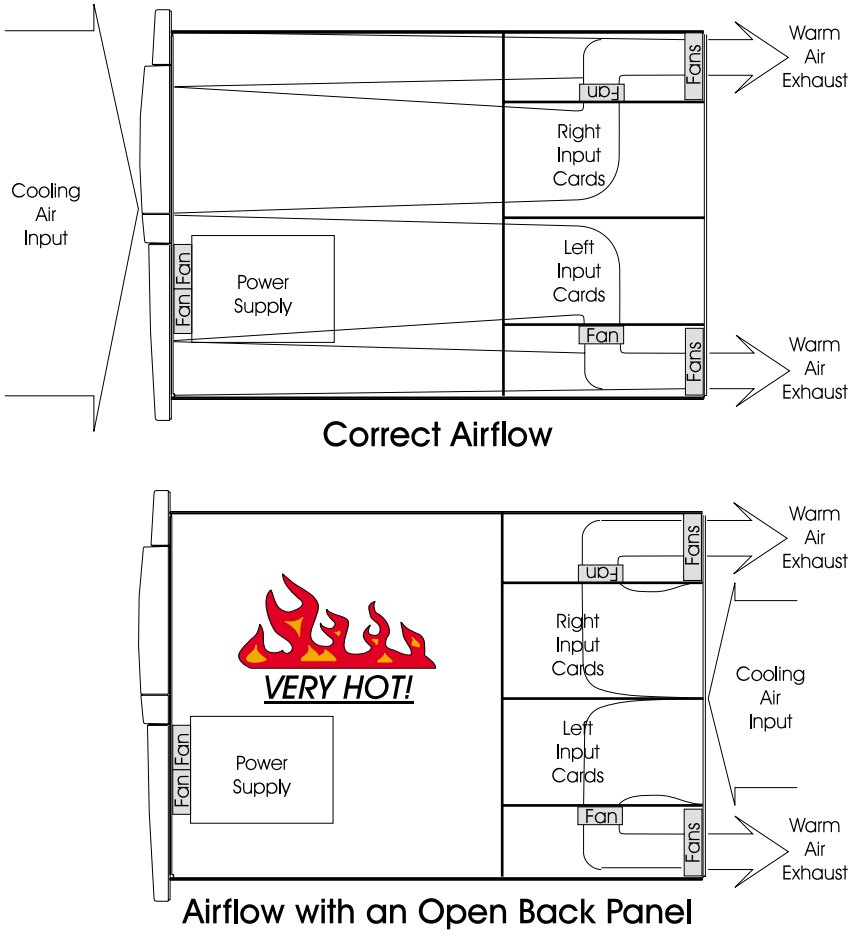


Figure 2-1 8150 Signal Chassis Air Flow

Dimensions and Physical Installation

Signal Chassis

Figure 2-2, on the facing page, shows the 8150 Signal Chassis dimensions.

Front View

This view shows the overall width of the Signal Chassis. The chassis fits in a standard rack (19.00 inches or 483mm wide).

Top View

This view shows the chassis depth from the rack ears to the back panel (24.75 inches or 629mm). Ensure your rack has adequate depth for cable installation.

The clearance needed for the front cover is 1.44 inches (37mm).

Side View

The side view shows the chassis height and rack support locations. Rack space required is 7.0 inches (178mm) or four rack units.

Three rack ear locations are available at the chassis front. The forward position places the chassis front flush with the rack.

There are three mirror image rear rack support locations available. "L" brackets (not shown), bolted to the rear rack rails, support the rear of the chassis by sliding into the rear supports. Install the rear supports as needed according to the rack depth.

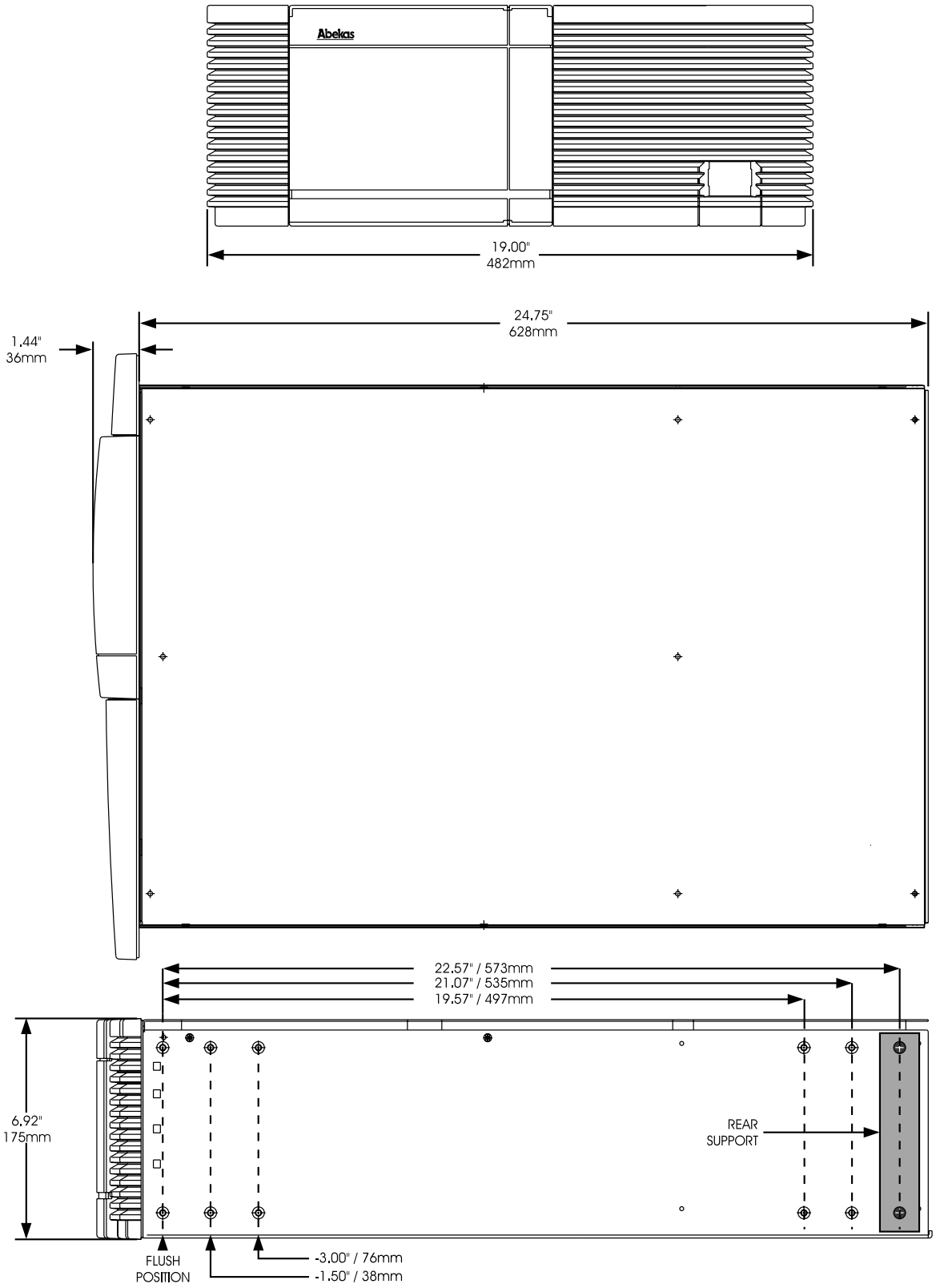


Figure 2-2 Signal Chassis Dimensions

Control Panel

Figure 2-3, on the facing page, shows the dimensions of the 8150 Control Panel for desk top installation.

Top View

The top view shows overall Control Panel dimensions.

Back View

The back view shows the Control Panel height from the base to the highest point.

Left/Side View

The left/side view shows the angle between the Control Panel base and the button surface, and from the base to the LCD display surface.

Right/Side View

The right/side view shows the location of the floppy disk drive and the clearance from the Control Panel base rear edge to the LCD display rear edge.

Control Panel Cutout Dimensions

If you are mounting your Control Panel in a console, please see the 3D Control Panel drawing at the back of this publication. Several views show console cutout dimensions.

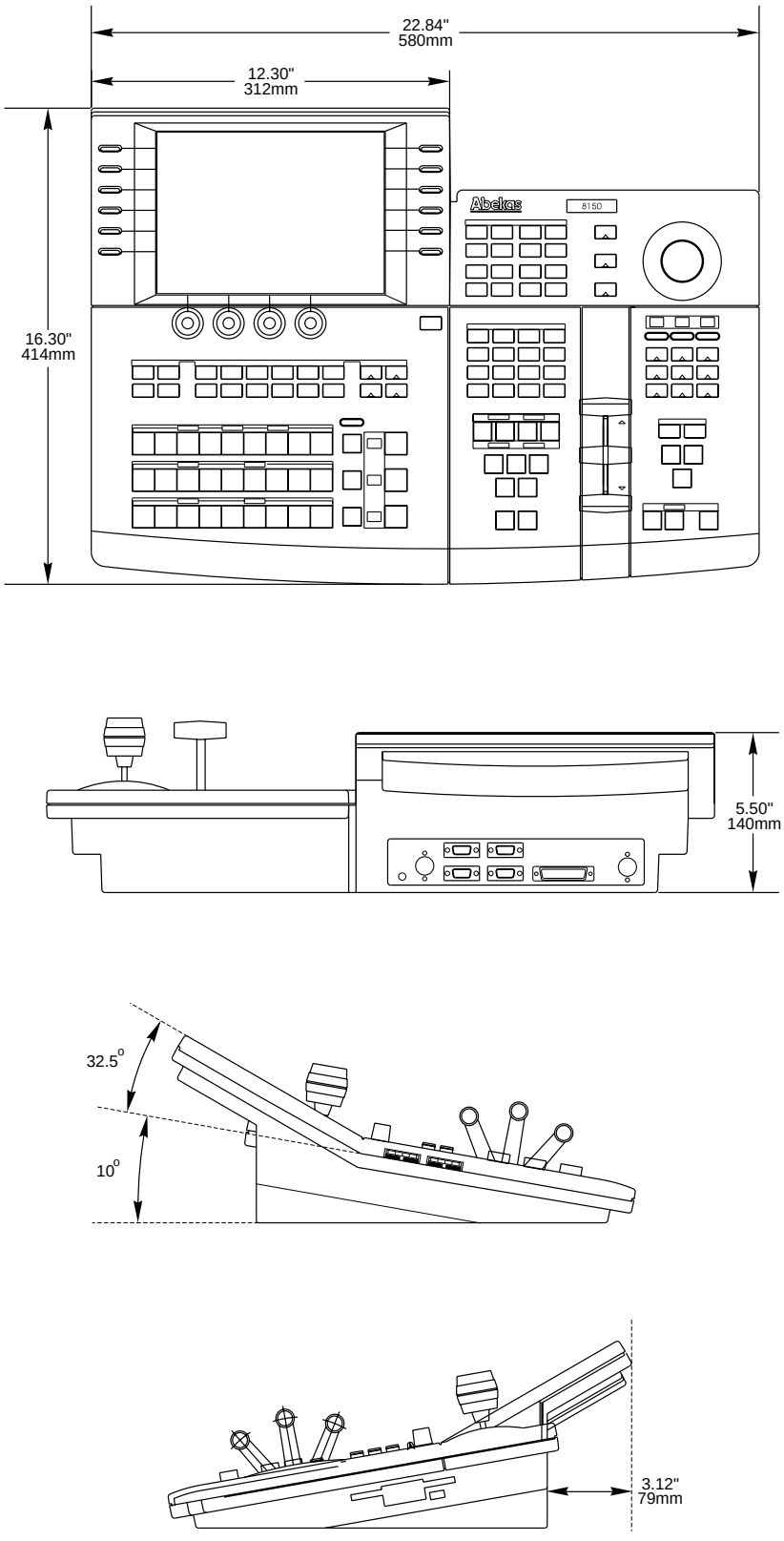


Figure 2-3 8150 Control Panel Dimensions

External Disk Drive

Mounting the Control Panel in a console blocks access to the internal disk drive. You must install the optional external floppy drive to save and recall switcher files. The figure below shows the dimensions for console mounting the optional external disk drive.

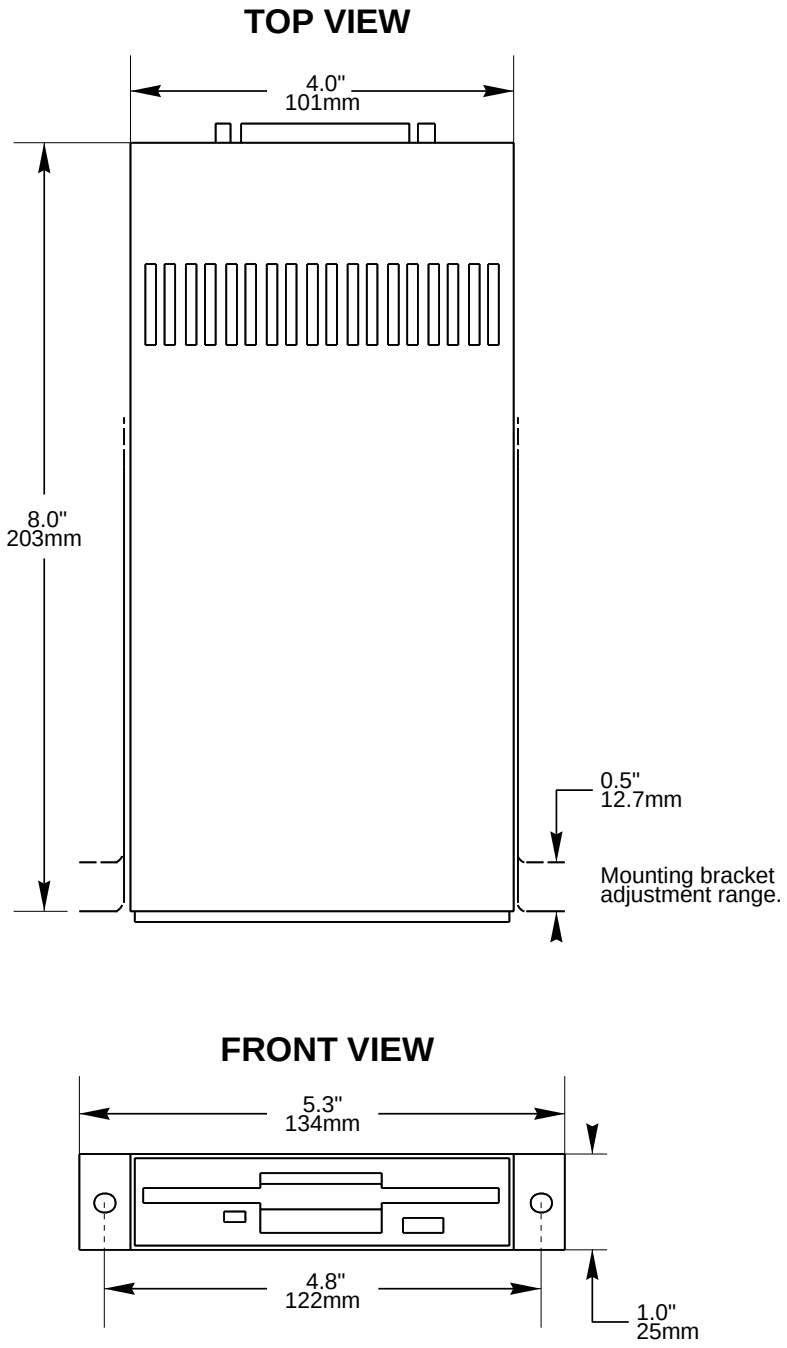


Figure 2-4 External Disk Drive Console Mount Dimensions

Signal Chassis Connections

Video Inputs

Inputs 1 - 14

A standard 8150 comes with four serial digital inputs (two Input modules). You can customize your video inputs by installing up to 12 more inputs (six more Input modules) to meet your requirements. Input modules plug into the chassis as shown in Figure 2-5, below.

The component digital and component analog inputs can be any combination of video or key sources. The exceptions are the 10-bit Component Analog and Composite Analog Input modules, which each accept one analog video input and one analog key input. Please see the following discussion on "Module Options."

Inputs 15/16 - Auxiliary (AUX) 3/4

This position can accept an Input module that provides two additional inputs. If the position is not needed for inputs, it can accept an optional Aux Output module, which requires that two Delaystik SIMMs be installed on the Switcher board. This provides two additional serial digital auxiliary bus output feeds. Please see the following discussion on "Module Options."

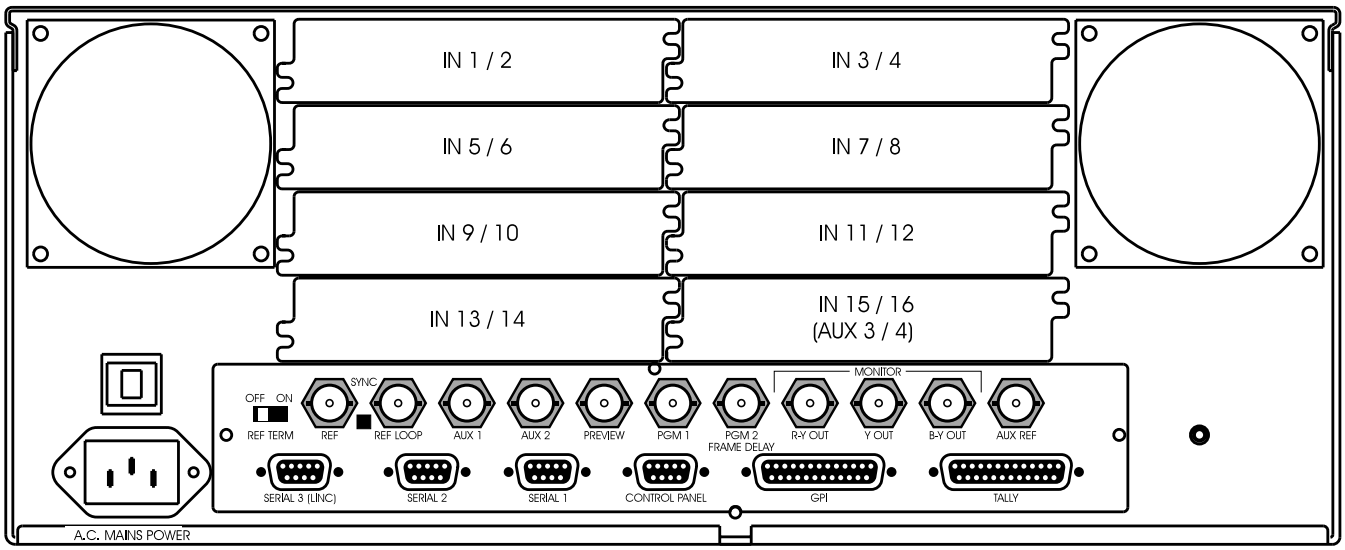


Figure 2-5 8150 Back Panel Connections

Module Options

Figure 2-6, below, shows the available Input and Output modules. The Digital Input modules are full 10-bit compatible, with 8-bit paths for the digital inputs selectable in the Engineering menu. The Digital Input modules also have one color matte generator per input that you can use as a fill source for borders, keys, backgrounds, etc., instead of the input signal. You can select and adjust the matte generators in the Engineering menu. The Analog Input modules do not have matte generators, but provide gain and horizontal picture position adjustments for each input. These adjustments are in the Engineering menu.

For information on installing and removing Input modules, see Section 3 – Option Installation.

> **NOTE: All eight input module locations must have either a module or a blank plate installed for proper cooling air flow inside the chassis.**

Dual Serial Digital Input

This module conforms to CCIR 601/SMPTE 259M serial component digital video standards. Input "A" connectors are odd numbered inputs; input "B" connectors are even numbered inputs. Input horizontal retiming is automatic, with a range of one half line advanced to two lines delayed from reference. Dual color LEDs appear through an opening near each BNC connector. These LEDs light green to indicate that the input is correct and genlocked. Yellow indicates that the input is not genlocked or does not match the system line standard. Unlit LEDs indicate that there is no input signal present.

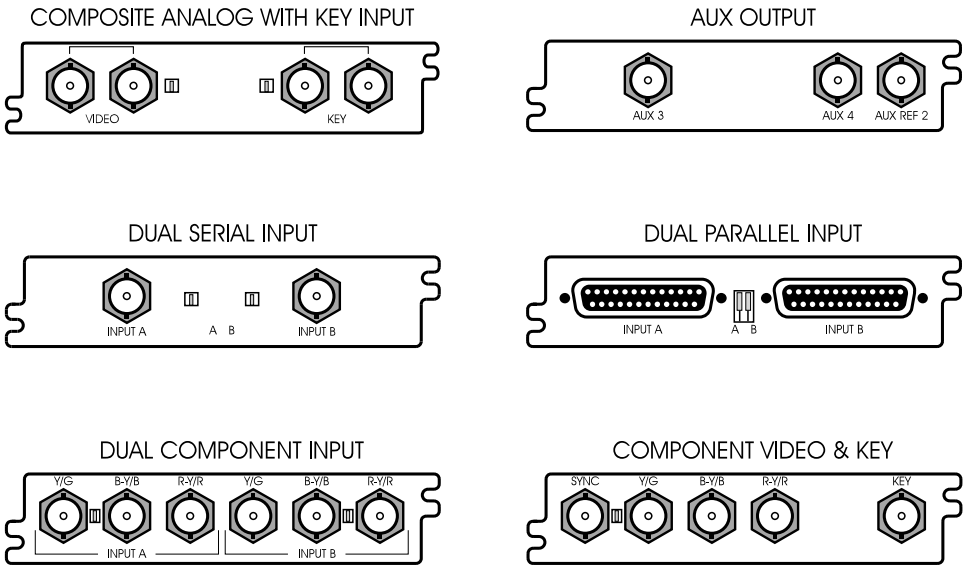


Figure 2-6 I/O Module Options

Dual Component Analog Input

This optional module supports several component analog formats, including SMPTE/EBU N10, Betacam®, MII®, RGB, and monochrome key signals. Input "A" connectors are odd numbered inputs, input "B" are even number inputs. Input horizontal retiming is automatic, with a range of one half line advanced to two lines delayed from reference. Input analog-to-digital conversion is eight bits per channel. You can set the input format type (RGB, several versions of Y/R-Y/B-Y, or key) in the Engineering menu. The Analog Input modules have dual color LEDs that light green to indicate that the input is present and genlocked. Yellow indicates that the input is present but not genlocked or does not match the system line standard. Red indicates that there is no sync present on the Y/G channel, or that there is no input present at all.

The Dual Analog Component Input module requires sync on the Y or G channel for proper operation. If you have sources that do not have sync on the Y or G component, you must connect the signal that does not have sync to the even numbered "B" input (2, 4, 6, etc.) and connect a cotimed signal with sync (for example, key or separate sync) to the odd numbered "A" input (1, 3, 5, etc.). See Section 5 – Engineering for more information.

Component Video + Key Input

This optional module provides one component analog video input and one analog key input. The video input can be one of several component analog formats, including SMPTE/EBU N10, Betacam, MII, and wide band RGB. The key input supports only monochrome key signals. Input horizontal retiming is automatic, with a range of one half line advanced to two lines delayed from reference. Input analog-to-digital conversion is ten bits per channel, with the ability to convert wide band video from high resolution graphics or telecine at the 4:4:4 sampling rate, for use with the 4:4:4 Chroma Keyer option.

You can set the input format type (RGB or several versions of Y/R-Y/B-Y, sampled at either the standard 4:2:2 rate or at the high resolution 4:4:4 rate) in the Engineering menu. If you select 4:4:4 sampling by using this input as a source for a 4:4:4 chroma key, the video is filtered for wide band response and converted to a 4:4:4 signal. This, however, occupies both the video path and the path normally used by the key signal, so you cannot use the key input in this mode.

This module accepts sync on the Y/G and key inputs or a separate sync input. If neither the video Y/G input nor the key input has sync, you can supply separate sync, setting the jumper to apply this sync to the video input. You must then use the Engineering menu Master/Slave setting to lock the key input. See Section 5 – Engineering for more information.

The 10-bit Component Analog Input module has dual color LEDs that light green to indicate that the video or key input is present and genlocked. Yellow indicates that the video or key sync input is present but not genlocked, or does not match the system line standard. Red indicates that there is no video or key sync present, or that there is no input present at all.

Composite Analog Video + Key Input

This optional module supports one composite video input (either NTSC or PAL, depending on the line standard selected), plus one analog key input, both sampled at 10-bit resolution. These two inputs also include a high impedance loop through for connection to other equipment. Connect a 75-ohm terminator to the loop through if it is not used.

The Composite Analog Input module has dual color LEDs that light green to indicate that the video or key input is present and genlocked. Yellow indicates that the video or key sync input is present but not genlocked, or does not match the system line standard. Red indicates that there is no video or key sync present, or that there is no input present at all.

Dual Parallel Digital Input

This optional module conforms to CCIR 601/SMPTE 125M parallel component digital video standards. Input "A" connectors are odd numbered inputs, and input "B" connectors are even numbered inputs. Input horizontal retiming is automatic, with a range of one half line advanced to two lines delayed from reference. Dual color LEDs appear through an opening near each input connector. These LEDs light green to indicate that the input is correct and genlocked. Yellow indicates that the input is not genlocked or does not match the system line standard. Unlit LEDs indicate that there is no input signal present.

Aux 3, 4 Output

This optional module conforms to CCIR 601/SMPTE 259M serial component digital video standards. It must be installed in the 15/16 AUX 3/4 module location, which precludes using inputs 15 and 16. The horizontal blanking, timing, and output bit resolution of this module follow the settings in the Engineering menu. You can select the sources for these outputs in the Miscellaneous menu. These outputs are delayed by two lines, 18 lines, or 34 lines from reference, depending on the source selected; you cannot select a one frame delay for these outputs. They are, however, always zero timed to each other. The Aux Ref 2 output on this module provides a dedicated (1 volt p-p) analog composite sync signal that matches the vertical timing of the Aux 3 and 4 outputs. This lets you genlock an external device that is being fed by these outputs.

Output Modules

Output Module Configurations

Because different systems have different characteristics, you can modify certain 8150 output settings to suit your requirements. You can change these settings: output blanking width (both horizontal and vertical), output bit resolution, and output horizontal timing.

The 8100 may have one of two output modules, while the 8150 contains only the Frame Delay Output module. The standard Output module provides all outputs as described on the following pages. The optional Frame Delay Output module provides the same functions, with these added features:

- The Program 1 output is switchable between a 34-line delay and a zero timed one frame delay from reference.
- The Program 2 output is zero timed to reference with a one frame delay.
- The Preview output is switchable between a 34-line delay and a zero timed one frame delay from reference.
- The Aux 1 and 2 output pair has a user selectable one frame delay in addition to their standard automatic delay selections.
- Vertical blanking widths are set in the Engineering menu instead of with a DIP switch on the board.
- 10-bit/8-bit resolution is set independently for the Program/Preview outputs and for the Aux 1 and 2 outputs.

> **NOTE: Of the following adjustments, only the Output Horizontal Timing adjustment affects the analog monitor output; the others affect only the serial digital outputs.**

Output Horizontal Blanking Width

Since the 8150 is designed around the CCIR 601 and SMPTE 259M component digital video standards, it processes the entire active picture described by those standards. The blanking width specifications of these digital standards are narrower than those for analog video, in both the 525-line and 625-line standards. If the Enhanced (Frame Delay) Output module is installed (all 8150s and some 8100s), you can adjust horizontal blanking by changing the front porch width, back porch width, or both. Additionally, you can turn vertical blanking on or off independently for ten lines in the vertical interval. Note that these adjustments affect only the digital outputs, not the analog monitor output, whose horizontal blanking width is fixed.

Press the ***H Blanking*** softkey to access the horizontal blanking width controls. If ***H Blanking*** is ***OFF***, the full digital active line is output;

however, the rise times of the blanking-to-active video transitions are unfiltered and may be subject to ringing. You may wish to turn ***H Blanking*** to ***ON*** to properly filter these transitions.

Use the following pushknobs to set horizontal blanking as needed:

- **Main Left –** Adjusts the blanking width of the left edge (back porch) of all Output module digital outputs in 2-pixel (148 nsecond) steps. The default, 1, selects minimum width; 4 selects maximum width.
- **Main Right –** Adjusts the blanking width of the right edge (front porch) of all Output module digital outputs in 2-pixel (148 nsecond) steps. The default, 1, selects minimum width; 4 selects maximum width.
- **Aux 3/4 Left –** Appears only if the Aux 3/4 option is installed. Adjusts the blanking width of the left edge (back porch) of both Aux 3/4 module digital outputs in 2-pixel (148 nsecond) steps. The default, 1, selects minimum width; 4 selects maximum width.
- **Aux 3/4 Right –** Appears only if the Aux 3/4 option is installed. Adjusts the blanking width of the right edge (front porch) of both Aux 3/4 module digital outputs in 2-pixel (148 nsecond) steps. The default, 1, selects minimum width; 4 selects maximum width.

Output Vertical Blanking Width

Vertical blanking width for analog 525-line systems is nominally specified as 20 lines, with the first unblanked lines being line 21 in field 1 and the last half of line 283 (20) in field 2. Likewise, vertical blanking width for analog 625-line systems is nominally specified as 25 lines, with the first unblanked lines being the last half of line 23 in field 1 and line 336 in field 2. You cannot change this blanking for the analog monitor output blanking.

The component digital counterparts to these analog standards, CCIR 601 and SMPTE 125M, let you blank certain lines of the vertical interval. You can unblank part of the vertical interval for inserting test signals, closed captioning, vertical interval timecode, etc., if needed.

Vertical Blanking – Standard Output Module (8100 Only)

On the standard Output module, use DIP switch S2 to blank or unblank lines in the vertical interval of the digital outputs. Change the vertical blanking settings from the default (shown below) as follows.

> **NOTE: Signals generated completely internally in the 8150 are blanked at the output and do not have their own blanking. If you reduce output vertical blanking width, any internally generated signals (primarily the**

SuperMatte and Framestore test patterns) may be present in any unblanked active lines when these signals are included in the 8150 video output.

STEP 1: Turn the Signal Chassis power off. Remove the four screws that secure the Output module to the rear of the chassis and pull the module out slightly.

STEP 2: Locate DIP switch S2 on the Output module. Note that switches 1 and 2 on S2 are turned on, and the other six switches are turned off. This is the default factory setting, which blanks the output according to the following chart. If this setting does not suit your needs, use the following chart to select the vertical blanking you do need. If the switch is on, it passes its designated line pair; if the switch is off, it blanks its designated line pair. Note that the switches only blank their designated line pairs and are otherwise independent of each other.

S2 Switch Setting On = Pass; Off = Blank	525 Systems Field 1/Field 2	625 Systems Field 1/Field 2
S2 switch 1	21/284	24/336
S2 switch 2	20/283	23/335
S2 switch 3	19/282	22/334
S2 switch 4	18/281	21/333
S2 switch 5	17/280	20/332
S2 switch 6	16/279	19/331
S2 switch 7	15/278	18/330
S2 switch 8	14/277	17/329

STEP 3: After making the necessary line blanking selections, reinstall the Output module in the Signal Chassis and replace the four screws. Turn the chassis power on.

STEP 4: To verify that the output is correctly blanked, create a flat color field with the SuperMatte generator signal and select it

on the Program bus. Observe the program output on a waveform monitor, and verify that the correct lines are blanked or unblanked as needed.

Vertical Blanking – Frame Delay Output Module

There is a control for vertical output blanking in the Engineering menu Output submenu. You can individually blank or unblank the first active line and the previous nine lines of each field. In the 525-line standard, you can blank/unblank lines 12 through 21 and 275 through 284. In the 625-line standard, you can blank/unblank lines 15 through 24 and 327 through 336.

Press the ***V Blanking*** softkey to access the controls for independently blanking or unblanking any of these lines. The **Blanking Status** pushknob label indicates which lines are blanked by displaying the line number with its two digits oriented vertically. In 525-line systems, the display looks like this:

11111111--
23456789--

In 625-line systems, the display looks like this:

11111222--
56789012--

The dashes (--) are "place holders" for the other lines that are currently unblanked. To change the blanking status of any line (plus its counterpart in Field 2), use the **Select Line** pushknob to select the line number whose blanking status you want to change, then press the ***V Blanking*** softkey. This toggles the **Blanking Status** display to add that line number if it was not present, or to remove it if it was present. The corresponding line in Field 2 is also blanked or unblanked accordingly.

Output Bit Resolution

The 8150 maintains full 10-bit processing throughout. However, if you feed its output to a device that accepts or processes only eight bits, you can configure the digital outputs to avoid banding and other truncation errors. (The analog monitor output always uses a 10-bit signal in its digital-to-analog conversion, and is not affected by this setting.) In the Engineering Output submenu, the ***Bits*** softkey toggles the following. ***10*** (the default setting) keeps the full 10-bit resolution of the internal processing. ***8 Rounded*** takes the two least significant bits (LSBs) of the 10-bit signal and rounds them down to the next lower 8-bit value if the binary value of the LSBs is 01. It rounds them up to the next higher 8-bit value if the binary value of the LSBs is 11. It randomly rounds them down

or up if the binary value of the LSBs is 10. ***8 Truncated*** simply removes the two LSBs from the 10-bit signal. This mode is recommended for troubleshooting only, and should not be used during normal operations.

With the standard Output module, there is one bit resolution setting for all digital outputs. With the Enhanced (Frame Delay) Output module only, there is a bit resolution setting for the Program and Preview outputs, a separate setting for the Aux 1 and 2 outputs, and a separate setting for the Aux 3 and 4 outputs if they are installed.

Output Horizontal Timing

On the standard Output module, the Program 1, Program 2, and Preview outputs are delayed 34 lines plus approximately 5 microseconds from reference. The Aux 1 and 2 outputs are delayed by either two lines, 18 lines, or 34 lines, depending on the source selected for them.

On the optional Frame Delay Output module, the Program 1 output is selectable between the 34-line delay and a full frame delay from reference. The Program 2 output has a fixed one frame delay. The Preview output is switchable between 34-line and one frame delays. The Aux 1 and 2 outputs have the above-mentioned variable delay, plus a selectable one frame delay from reference. The Aux 3 and 4 outputs have only the variable delay; you cannot select a one frame delay for these outputs.

With either Output module installed, you can advance the output horizontal timing by as much as 9.25 microseconds if necessary. Use the **Output Timing** pushknob in the Engineering Output submenu to

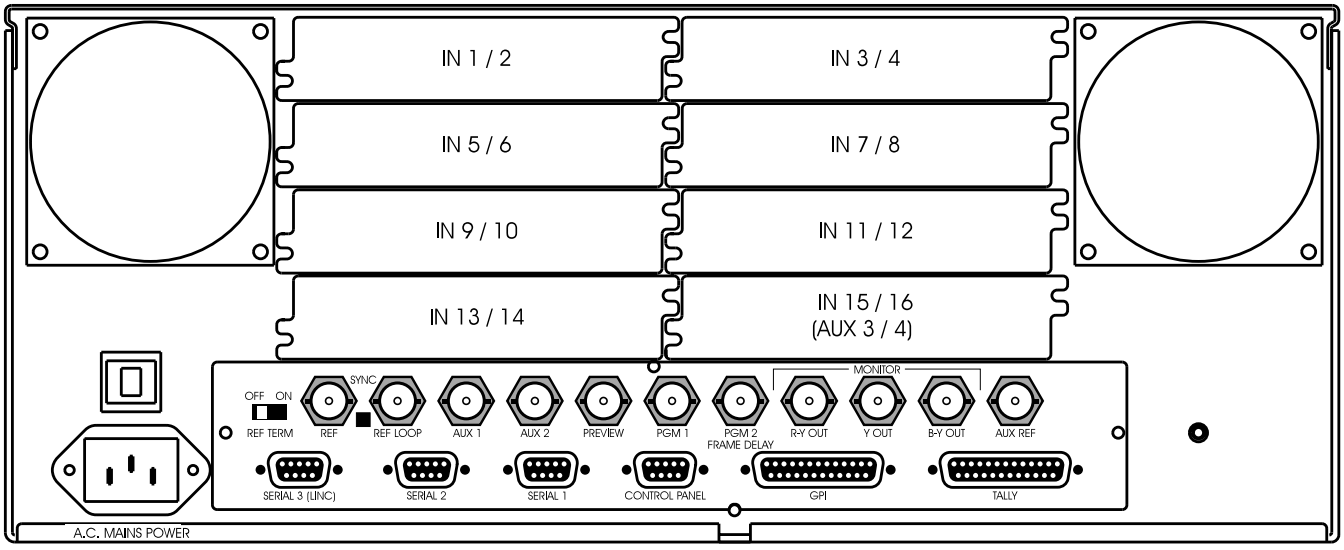


Figure 2-7 8150 Back Panel Connections

advance the output horizontal phase of all digital outputs by up to 9.25 microseconds, in 18.5 nanosecond (1/4 pixel) steps.

Output Module Connections

The following describes all Output module connectors.

Reference (REF, REF LOOP)

Two 75Ω BNC connectors provide a passive looping system reference connection. Feed the 8150 color black or composite sync. The system accepts 525 or 625 line reference feeds. Set the system line standard to match the reference line standard in the Engineering menu Miscellaneous submenu. The LED between the connectors lights green to indicate sync is present and matches the system standard (525 or 625). It lights yellow to indicate that sync does not match the selected system standard. It lights red to indicate that no sync present at all.

Termination Switch

Use the reference termination switch to terminate nonlooping reference feeds into 75Ω.

Auxiliary Outputs (AUX 1, AUX 2)

Optional CCIR 601/SMPTE 259M serial digital auxiliary bus output feeds are provided on 75Ω BNC connectors. You can choose the output video source for each Aux output in the Miscellaneous menu. Note that the connectors are present even if option is not installed.

With the standard Output module, these outputs are delayed by two lines, 18 lines, or 34 lines from reference, depending on the source selected. With the Enhanced Frame Delay Output module only, in addition to the above delays, you can select a one frame delay for these outputs in order to zero time them back into your system. With either Output module, the Aux 1 and 2 outputs are always zero timed to each other.

Preview Output (PVW)

One CCIR 601/SMPTE 259M serial digital preview output is provided on a 75Ω BNC connector. With the standard Output module, this output is delayed approximately 34 lines from reference (zero timed to the program outputs). With the Enhanced Frame Delay Output module only, you can also select a one frame delay to match the Program 2 output.

Program Outputs (PGM 1, PGM 2)

Two CCIR 601/SMPTE 259M serial digital program outputs are provided on 75Ω BNC connectors. With the standard Output module, both outputs are delayed approximately 34 lines from reference. With the Frame Delay Output module only, the Program 1 output is selectable between a 34-line delay or a full frame delay, while the Program 2 output is fixed at a full frame delay from reference.

Analog Monitor Output

R-Y Out, Y-Out, B-Y Out

This output provides either a program or preview analog monitor feed on 75Ω BNC connectors, according to the setting in the Preview Bus Control & Miscellaneous submenu of the Miscellaneous menu. This output is in the SMPTE/EBU N10 component analog video format (100 percent color bars = 700 mVp-p on all channels with 300 mVp-p sync on Y). The vertical and horizontal timing of this output follows the source selected for it (Preview or Program with the standard Output module, or Preview, Program 1, and Program 2 for the Enhanced Output module).

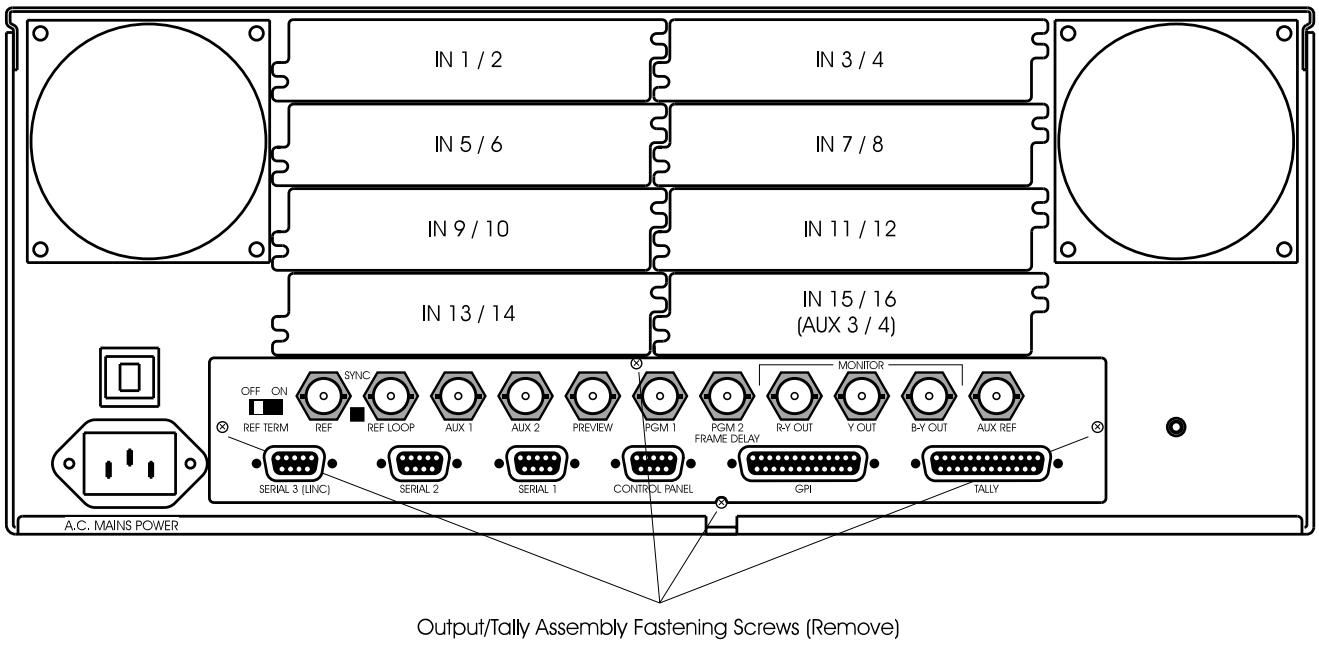
> **NOTE: Use this output only for monitoring and not for program distribution or recording.**

Auxiliary Reference (AUX REF)

The Aux Ref signal, provided on a 75Ω BNC connector, is analog composite sync (at 1 volt p-p) that is always timed to the Aux 1 and 2 outputs. You may need to use the Aux Ref signal to genlock external devices being fed by the Aux 1 and 2 outputs due to their delay from system reference.

Remote Ports: Serial 1, Serial 2, Serial 3 (LINC)

There are three serial RS-422 ports on 9-pin female sub-miniature D connectors. These ports provide the control interface for peripheral LINC devices and computer editing systems. A variety of remote protocols are supported, and you can select the port settings from the Engineering menu.



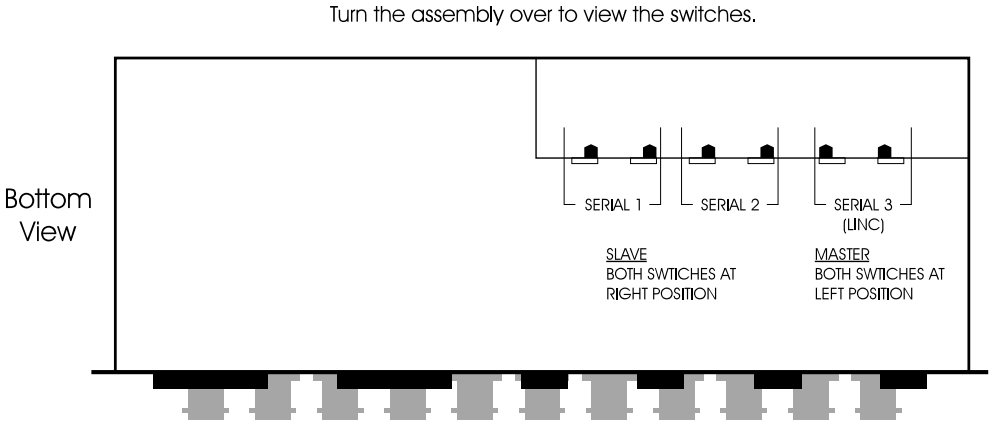


Figure 2-8 Serial Port Configuration

Control Panel

This serial RS-422 port provides the Control Panel interface on a 9-pin female sub-miniature D connector.

GPI

This connector provides eight general purpose interface (GPI) inputs and eight GPI outputs on a 25-pin female sub-miniature D connector.

Tally

This connector provides 16 input source tally outputs on a 25-pin female sub-miniature D connector.

AC Mains Power

The 8150 operates on 100, 120, 220, or 240-volt mains power provided by a standard AC mains receptacle.

Voltage Selection

The 8150 power supply automatically adapts to the line voltage and frequency supplied (90 - 264 VAC, 47 - 63 Hz).

Control Panel Connections

Keyboard

This connector lets you use an off-the-shelf PC AT keyboard with a 5-pin DIN connector. You can use the keyboard to name inputs and disk files.

RS-232 / RS-422

This serial port connects a mouse, mouse pen, or trackball to let you draw masks in the framestore.

> **NOTE: This single data port supports two electrical communication formats.**

RS-232 signals are provided on a 9-pin male sub-miniature D connector. RS-422 signals are provided on a 9-pin female sub-miniature D connector.

Control In

This serial port connects the Control Panel to the Signal Chassis control chain. It is a 9-pin female sub-miniature D connector.

Control Out

This serial port connects additional Control Panels to the Signal Chassis control chain. You can connect up to four Control Panels to the Signal Chassis control chain. The Control Panel maximum chain length is 2000 feet (610 meters). This is a 9-pin female sub-miniature D connector.

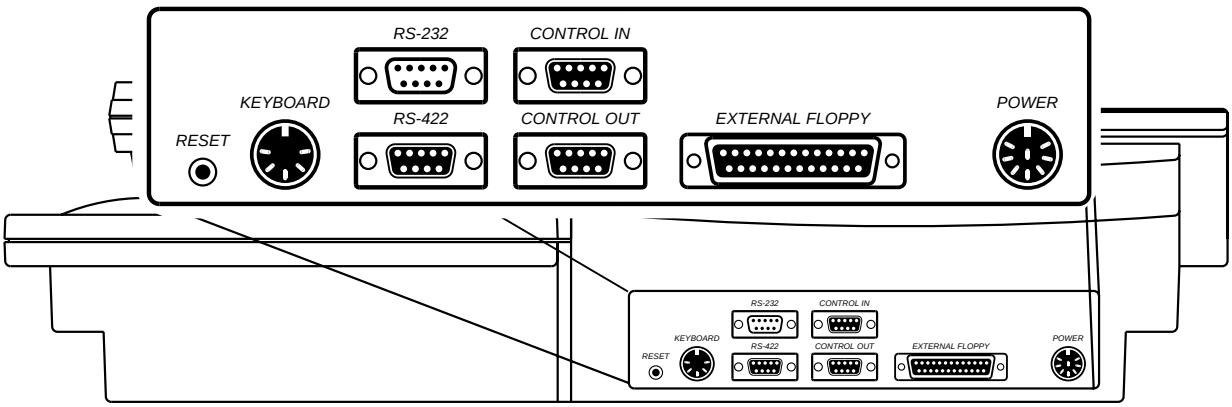


Figure 2-9 Control Panel Connections

External Floppy

This port connects to an external 3.5" 1.44MB or 720KB floppy disk drive with a 25-pin female sub-miniature D connector. This option is required if you install the Control Panel in a console that prevents access to the internal floppy disk drive.

Power

The Control Panel receives DC operating voltages on this 8-pin female DIN connector.

Reset Button

Pressing this button resets the CPU in the Control Panel only, and does not affect the CPUs in the 8150 Signal Chassis. Press this button if the Control Panel does not communicate after you have reset the Signal Chassis.

Using Multiple Control Panels

The 8150 Signal Chassis can connect to and communicate with multiple Control Panels. All Control Panels connected to a Signal Chassis are in communication with that chassis, but only one panel has control of that chassis. Control Panels that are not transmitting to the Signal Chassis are still receiving, and show the current status of all crosspoint buttons, transition control buttons, and menu displays.

Physical Connections

Each Control Panel has two 9-pin connectors labeled CONTROL IN and CONTROL OUT. These connectors are wired together to create a passive loop. To connect more than one Control Panel to a Signal Chassis, connect the supplied Control Panel cable or a standard RS-422 cable from the Signal Chassis CONTROL PANEL port to the CONTROL IN port on one of the Control Panels. Next, connect another RS-422 cable from the CONTROL OUT port to the CONTROL IN port on the next Control Panel. Continue until you connect all Control Panels.

Acquiring and De-Acquiring Control

When a single Control Panel 8150 system powers up, the Control Panel automatically lights its **ACQUIRE** button (right side of the Control Panel), indicating that it has control of the Signal Chassis. Double pressing this button turns off the LED and disables control. The Control Panel still communicates with the Signal Chassis: it receives, but does not transmit. A single press of the **ACQUIRE** button reestablishes control.

When a multiple Control Panel 8150 system is first powered up, no Control Panel controls the Signal Chassis. Press the **ACQUIRE** button on any panel to gain control of the Signal Chassis. As long as a Control Panel is acquired, no other Control Panel can have control.

To de-acquire a Control Panel, double press the **ACQUIRE** button to turn off its LED. At this point, you can acquire any Control Panel by pressing its **ACQUIRE** button once.

Once a multiple Control Panel system is operational, rebooting or power cycling any Control Panel or the Signal Chassis maintains the acquire/de-acquire status of each Control Panel, and it does not need to be reconfigured.

Troubleshooting Hints

If the Control Panel does not appear to have control of the Signal Chassis, check the **ACQUIRE** button LED to verify that it is on. If not, press **ACQUIRE** once to regain control. If it is part of a multiple Control Panel system, check the other Control Panels to see if one is acquired.

If the **ACQUIRE** LED is lit but you still have no control over the Signal Chassis, press the RESET button on the rear connector panel of the Control Panel to reboot it. If, after a reboot, there is still no communication, follow the steps outlined in the Control Panel menu display:

STEP 1: Press a menu button to refresh the menu display.

STEP 2: Check the cable connection between the Signal Chassis and the Control Panel.

STEP 3: Check that the Signal Chassis is powered up.

STEP 4: Reboot the Signal Chassis by pressing the Switcher board reset button.

Signal Chassis Connector Detail

Serial 1, 2, 3 Connectors

The serial connectors can be configured for RS-422 master or slave operation (RS-232 format is not supported). See Figure 2-8 for configuration details.

> **NOTE: Only Serial 3 supports LINC (Locally Integrated Node Control). It is set as an RS-422 master as shipped from the factory.**

Serial Port Configuration

Serial port configuration switches are on the Output/Tally assembly. To set the configurations, remove the screws indicated in the top part of Figure 2-8, and pull the assembly from the chassis. The bottom part of Figure 2-8 shows the configuration switch location and settings.

The 8150 comes from the factory with Serial 3 (LINC) set as a master, Serial 1 and 2 as slaves. This configuration suits most applications.

8150 SIGNAL CHASSIS

SERIAL 1, 2, 3, CONNECTOR PIN FUNCTIONS

9 Pin Female Sub-Miniature D Connector

SERIAL...

PIN #	RS-422 MASTER	RS-422 SLAVE
1	Chassis Ground	
2	Receive (Rx) -	Transmit (Tx) -
3	Transmit (Tx) +	Receive (Rx) +
4	Signal Ground	
5	No Connection	
6	Signal Ground	
7	Receive (Rx) +	Transmit (Tx) +
8	Transmit (Tx) -	Receive (Rx) -
9	Chassis Ground	

Table 2-1 Serial 1 - 3 Connector Pin Functions

Control Panel Connector

The Control Panel connector is wired as an RS-422 master port. (The Control Panel "Control In" connector is wired as an RS-422 slave port.) You can use a generic RS-422 cable wired pin-to-pin for the Control Panel connection.

8150 SIGNAL CHASSIS
CONTROL PANEL CONNECTOR PIN FUNCTIONS
9 Pin Female Sub-Miniature D Connector

CONTROL PANEL

PIN #	RS-422 MASTER
1	Chassis Ground
2	Receive (Rx) -
3	Transmit (Tx) +
4	Signal Ground
5	No Connection
6	Signal Ground
7	Receive (Rx) +
8	Transmit (Tx) -
9	Chassis Ground

Table 2-2 Control Panel Connector Pin Functions

GPI Connector

GPI Inputs

All GPI inputs work as switch closures through an opto-isolator. Figure 2-10, below, shows a typical interface. See Table 2-3 for the connector pinout.

Electrical Specifications

The following specifications are for the opto-isolator (device # H11L1) used in the 8150.

INPUT LED MAXIMUM RATINGS

- Reverse Voltage (V_R): 6 V.
- Continuous Forward Current (I_F): 60 mA.
- Peak Forward Current (300 µSec Pulse): 1.2 A.
- Forward (Turn On) Voltage (V_F): 1.5 V (1.2 V Typical).
- Isolation Surge Voltage (Peak AC Voltage, 60Hz, 1 Second Duration): 7500 V.

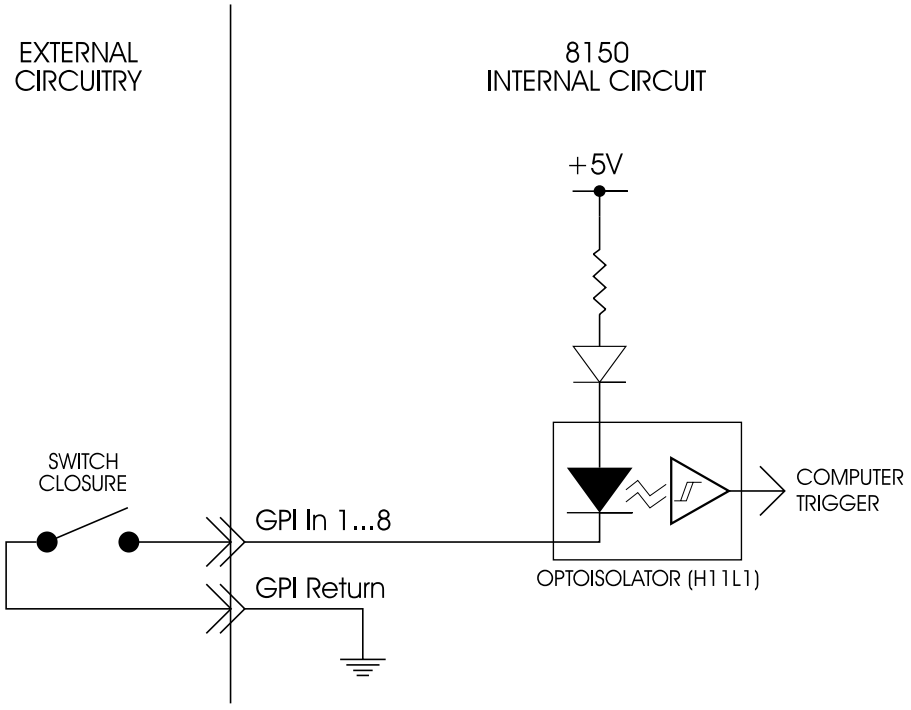
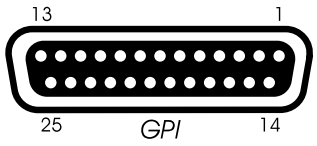


Figure 2-10 Typical GPI Input Circuit

8150 SIGNAL CHASSIS
GPI CONNECTOR PIN FUNCTIONS
25 Pin Female Sub-Miniature D Connector



PIN #	FUNCTION
1	Chassis Ground
2	GPI In 1
3	GPI In 2
4	GPI In 3
5	GPI In 4
6	GPI In 5
7	GPI In 6
8	GPI In 7
9	GPI In 8
10	GPI Out 2
11	GPI Out 4
12	GPI Out 6
13	GPI Out 8
14	GPI Common Return
15	GPI Common Return
16	GPI Common Return
17	GPI Common Return
18	GPI Common Return
19	GPI Common Return
20	GPI Common Return
21	GPI Common Return
22	GPI Out 1
23	GPI Out 3
24	GPI Out 5
25	GPI Out 7

Table 2-3 GPI Connector Pin Functions

GPI Outputs

All GPI outputs work as solid state opto-isolated switch closures. Opto-isolators have limited drive current capability, so some form of external drive interface is needed for applications that need greater current than that supplied by the opto-isolator output. Figure 2-11, below, shows an example current driver circuit you can build. The 2N2222 general purpose transistor provides up to 650mW of drive. Check all applicable data sheets for the external devices shown below before building your current driver.

Electrical Specifications

The following specifications are for the opto-isolator (device # 4N33) used in the 8150.

OUTPUT DETECTOR MAXIMUM RATINGS

- Collector - Emitter Voltage (V_{CEO}): 30 V.
- Emitter - Collector Voltage (V_{ECO}): 5 V.
- Collector Current - Continuous (I_C): 150 mA.
- Power Dissipation (P_D): 150 mW.
- Isolation Surge Voltage (Peak AC Voltage, 60Hz, 1 Second Duration): 7500 V.

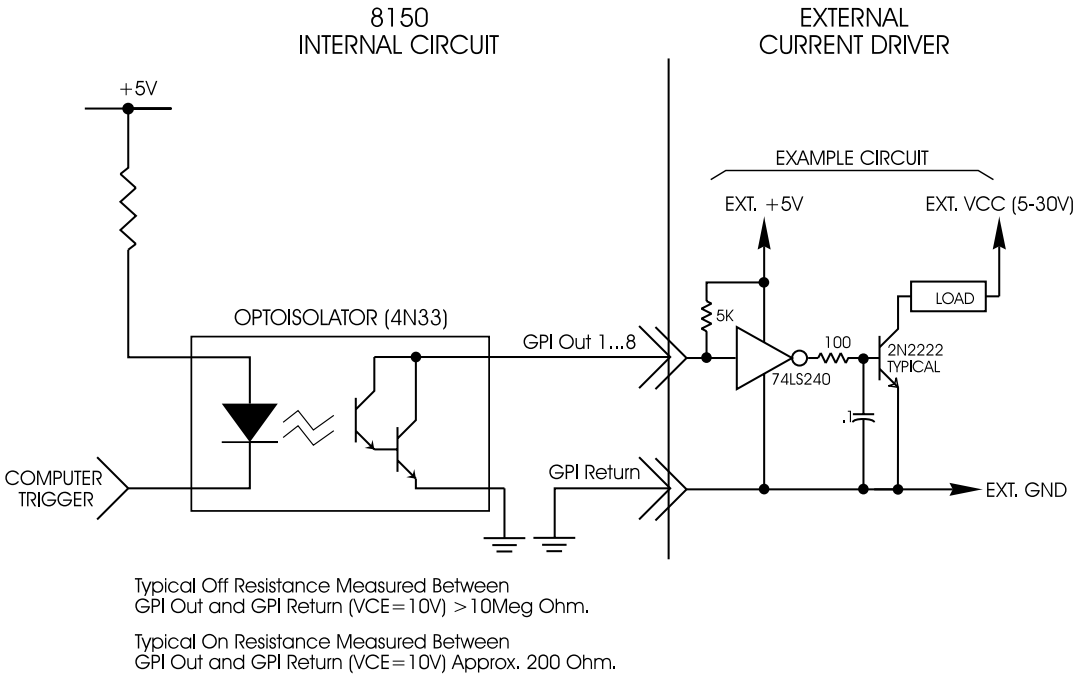


Figure 2-11 Typical GPI Output Circuit

Tally Connector

All Tally outputs are opto-isolated open-collector outputs. Opto-isolators have limited current capability to drive some relays or tally lamps. An external drive interface is needed for applications that need greater current than that supplied by the opto-isolator output. (See Figure 2-11 for an example current driver circuit.) Figure 2-12, below, shows a tally relay interface using locally available parts, or you can obtain them from Accom.

Electrical Specifications

The following specifications are for the opto-isolator (device # 4N33) used in the 8150.

OUTPUT DETECTOR MAXIMUM RATINGS

- Collector - Emitter Voltage (V_{CEO}): 30 V.
- Emitter - Collector Voltage (V_{ECO}): 5 V.
- Collector Current - Continuous (I_C): 150 mA.
- Power Dissipation (P_D): 150 mW.
- Isolation Surge Voltage (Peak AC Voltage, 60Hz, 1 Second Duration): 7500 V.

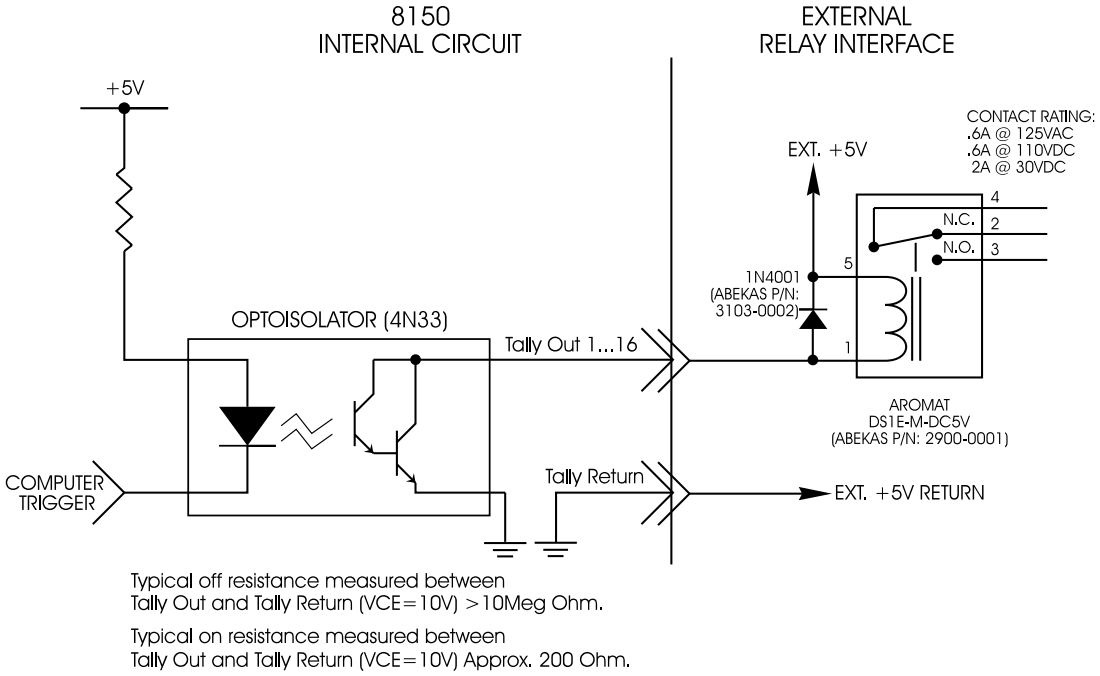
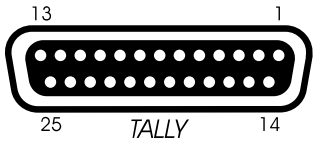


Figure 2-12 Typical Tally Output Circuit

8150 SIGNAL CHASSIS

TALLY CONNECTOR PIN FUNCTIONS

25 Pin Female Sub-Miniature D Connector



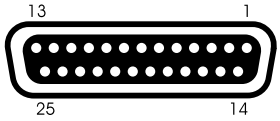
PIN #	FUNCTION
1	Chassis Ground
2	Input 1 Tally
3	Input 2 Tally
4	Input 3 Tally
5	Tally Common Return
6	Input 4 Tally
7	Input 5 Tally
8	Input 6 Tally
9	Tally Common Return
10	Input 7 Tally
11	Input 8 Tally
12	Input 9 Tally
13	Tally Common Return
14	Input 10 Tally
15	Input 11 Tally
16	Input 12 Tally
17	Tally Common Return
18	Input 13 Tally
19	Input 14 Tally
20	Input 15 Tally
21	Tally Common Return
22	Input 16 Tally
23	Tally Common Return
24	Tally Common Return
25	Tally Common Return

Table 2-4 Tally Connector Pin Functions

Parallel Digital Connector

Table 2-5, below, gives the pin functions for the CCIR 656/SMPTE 125M parallel digital connectors on the Dual Parallel Input modules.

8150 SIGNAL CHASSIS
PARALLEL DIGITAL CONNECTOR PIN FUNCTIONS
25 Pin Female Sub-Miniature D Connector



PIN #	FUNCTION
1	Clock
14	Clock Return
2	System Ground A
15	System Ground B
3	Data 9
16	Data 9 Return
4	Data 8
17	Data 8 Return
5	Data 7
18	Data 7 Return
6	Data 6
19	Data 6 Return
7	Data 5
20	Data 5 Return
8	Data 4
21	Data 4 Return
9	Data 3
22	Data 3 Return
10	Data 2
23	Data 2 Return
11	Data 1
24	Data 1 Return
12	Data 0
25	Data 0 Return
13	Cable Shield

Table 2-5 Parallel Digital Connector Pin Functions

Control Panel Connector Detail

Keyboard Connector

This connector supports an off-the-shelf PC AT keyboard. See Table 2-6, below, for standard IBM PC AT pin functions.

8150 CONTROL PANEL
KEYBOARD CONNECTOR PIN FUNCTIONS
5 Pin Female DIN Connector

PIN #	FUNCTION
1	Clock
2	Data
3	No Connection
4	Signal Ground
5	VCC (+5VDC)

Table 2-6 Keyboard Connector Pin Functions

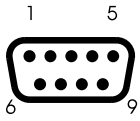
RS-232 Connector

The RS-232 and RS-422 ports support several pointing devices for fine control of wipe patterns when drawing masks in the framestore. Table 2-7, below, gives the pin function details for the RS-232 port.

8150 CONTROL PANEL

RS-232 CONNECTOR PIN FUNCTIONS

9 Pin Male Sub-Miniature D Connector



RS-232

PIN #	FUNCTION (RS-232)
1	No Connection
2	Receive Data (Rx)
3	Transmit Data (Tx)
4	No Connection
5	Signal Ground
6	No Connection
7	+12VDC
8	+12VDC
9	No Connection

Table 2-7 RS-232 Connector Pin Functions

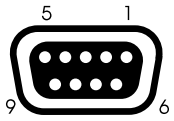
RS-422 Connector

The RS-422 and RS-232 ports support several pointing devices for fine control of wipe patterns when drawing masks in the framestore. Table 2-8, below, gives the pin function details for the RS-422 port.

8150 CONTROL PANEL

RS-422 CONNECTOR PIN FUNCTIONS

9 Pin Female Sub-Miniature D Connector



RS-422

PIN #	FUNCTION (RS-422 SLAVE)
1	Chassis Ground
2	Transmit (Tx) -
3	Receive (Rx) +
4	Signal Ground
5	No Connection
6	Signal Ground
7	Transmit (Tx) +
8	Receive (Rx) -
9	Chassis Ground

Table 2-8 RS-422 Connector Pin Functions

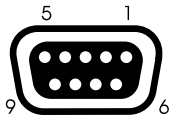
Control In, Out Connectors

Use the Control In connector to connect to the Signal Chassis "Control Panel" connector. Use the Control Out connector to loop control to the next Control Panel (you can loop up to four Control Panels). Both ports are wired as RS-422 slave ports. See Table 2-9 below for pin function details.

8150 CONTROL PANEL

CONTROL IN, OUT CONNECTOR PIN FUNCTIONS

9 Pin Female Sub-Miniature D Connector



CONTROL...

PIN #	FUNCTION (RS-422 SLAVE)
1	Chassis Ground
2	Transmit (Tx) -
3	Receive (Rx) +
4	Signal Ground
5	No Connection
6	Signal Ground
7	Transmit (Tx) +
8	Receive (Rx) -
9	Chassis Ground

Table 2-9 Control In, Out Connector Pin Functions

External Floppy Connector

Use this connector to install the optional external floppy disk drive. Table 2-10, below, shows the External Floppy connector pin functions.

8150 CONTROL PANEL
EXT. FLOPPY CONNECTOR PIN FUNCTIONS
25 Pin Female Sub-Miniature D Connector

PIN #	FUNCTION
1	$\overline{\text{RDD}}$
2	Signal Ground
3	$\overline{\text{WE}}$
4	$\overline{\text{WD}}$
5	$\overline{\text{STEP}}$
6	$\overline{\text{IDX}}$
7	$\overline{\text{TR00}}$
8	$\overline{\text{WP}}$
9	$\overline{\text{HDL}}$
10	$\overline{\text{DIRC}}$
11	(Logical High)
12	$\overline{\text{DS4}}$
13	No Connection
14	Signal Ground
15	Signal Ground
16	Signal Ground
17	Signal Ground
18	Signal Ground
19	Signal Ground
20	+5VDC
21	+5VDC
22	+5VDC
23	$\overline{\text{HS}}$
24	$\overline{\text{DS2}}$
25	$\overline{\text{DCHG}}$

Table 2-10 External Floppy Connector Pin Functions

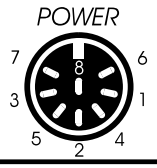
Power Connector

Table 2-11, below, gives the Power connector pin functions.

8150 CONTROL PANEL

POWER CONNECTOR PIN FUNCTIONS

8 Pin Female DIN Connector



PIN #	FUNCTION
1	+5VDC
2	+12VDC
3	DC Return
4	+5VDC
5	DC Return
6	+5VDC
7	DC Return
8	No Connection

Table 2-11 Power Connector Pin Functions

Section 3

Option Installation

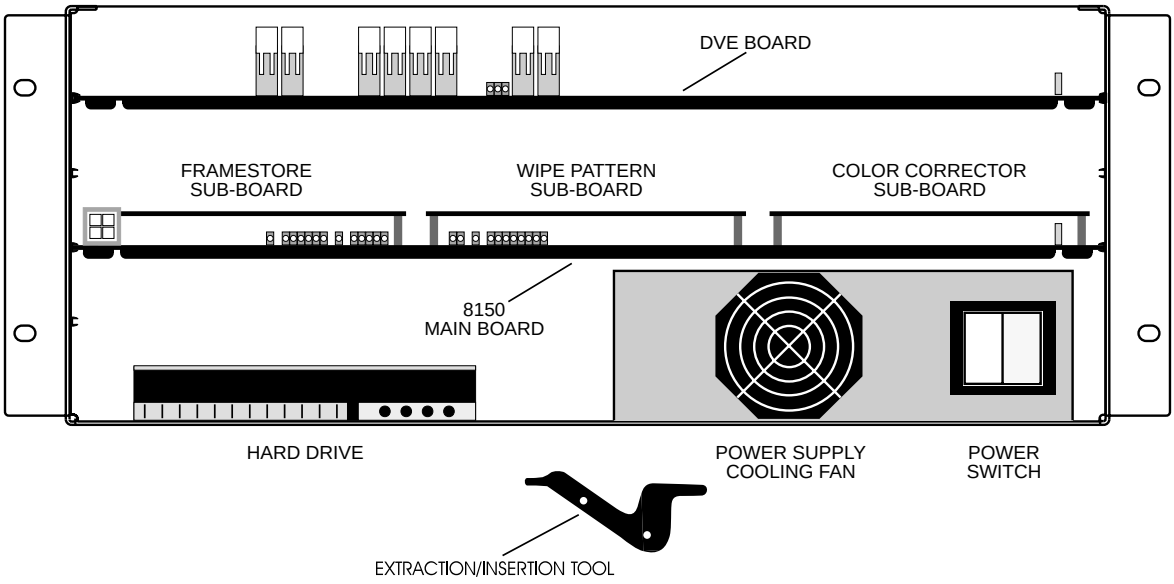
This section explains how to identify and install 8150 options and sub-assemblies. The 8150 is configured at the factory, but you may upgrade your system later, or you may need to identify installed options. Some option sub-boards plug into the 8150 Main board with standoff supports. Others are SIMM type plug-ins. Still others plug into the rear of the chassis or attach to the interior of the chassis. Figure 3-1, on the following page, shows the Main and DVE board locations in the 8150 Signal Chassis. Remove the integral front cover/air filter to access the boards.

WARNING: Removing the Main board disconnects the RAM battery backup. Save all effects, personality files, and engineering setups to disk before extracting the board.

Use the Accom supplied tool to extract boards from the chassis. Lay the board(s) on a clean, static free, grounded work surface.

NOTE: See the instructions at the front of this manual. Observe all static electricity precautions you would normally follow when handling static sensitive electronic components. Handling the 8150 Main Switcher or DVE boards (or the sub-boards) casually may cause failure.

SIGNAL CHASSIS - FRONT INTERNAL VIEW



SIGNAL CHASSIS - TOP INTERNAL VIEW

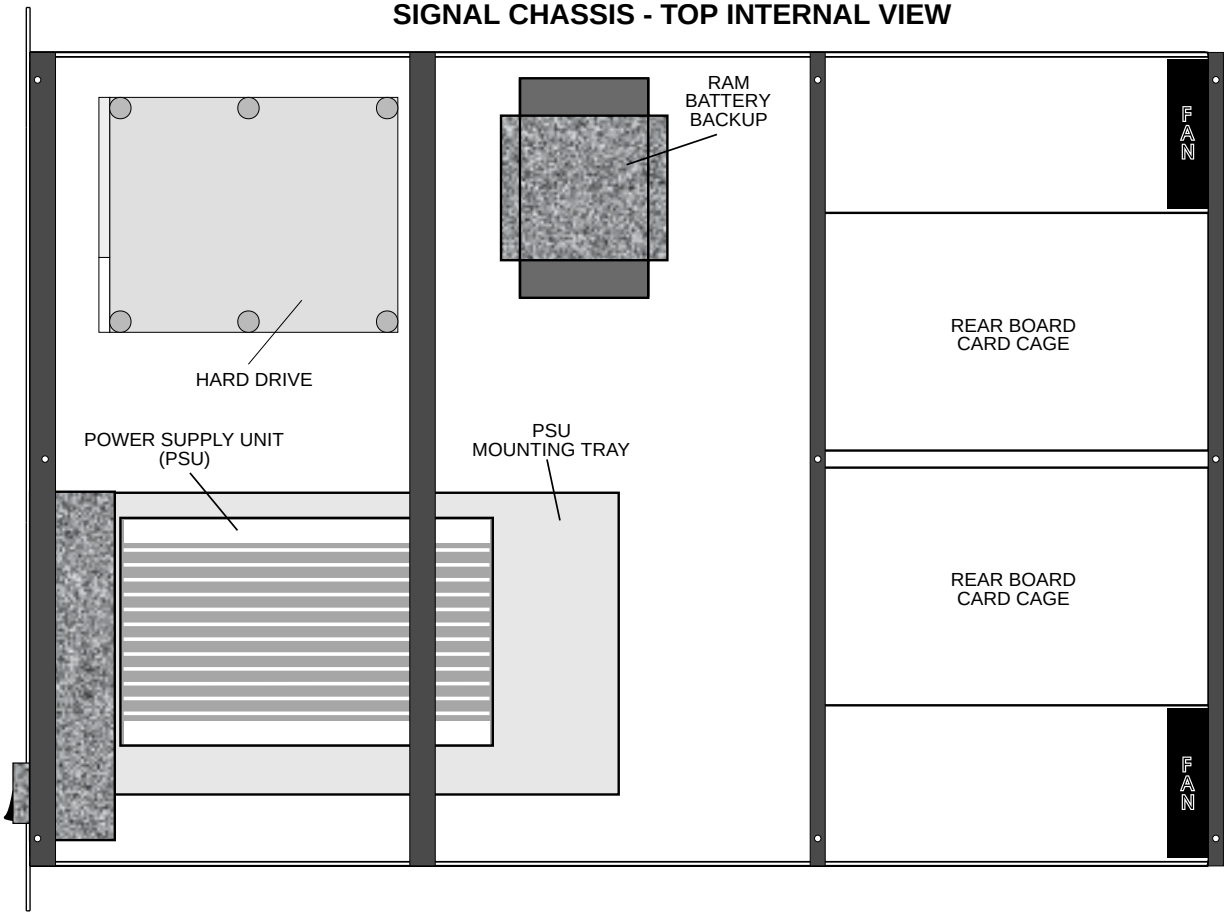


Figure 3-1 8150 Signal Chassis Major Components

Option Identification

Figure 3-2, on the following page, shows option board locations for the Main board. Figure 3-3 shows drawings of the various input option boards. To identify the options installed in your 8150, examine Figures 3-2 and 3-3, and see the text below.

Aux 1, 2

Aux buses 1 and 2 are active if Delaystik SIMMs are installed at locations UX9 and UW10 as indicated.

Aux 3, 4

Aux buses 3 and 4 are active if Delaystik SIMMs are installed at locations UV14 and UX14 as indicated, and the Aux 3, 4 Output module is installed in the IN 15/16 (AUX 3/4) slot at the chassis rear.

DVE Board

The DVE option is active if the DVE board is installed in the top Main board slot. A "super-charger" DVE CPU interface sub-board is also required on the Main board.

4:4:4 Chroma Key

The 4:4:4 Chroma Key option is active if Delaystik SIMMs are installed at locations UW2, UW9, and UX10 as indicated.

Extended Memory

The Extended Memory option doubles the size of the Dynamic Random Access Memory (DRAM) in the 8150, from 4MB to 8MB. This increases the number of TimeFrame effects that you can store from 25 to 100. It also provides enhanced auto chroma key setup when using the Color Pick feature. The Show Status menu System status box shows the size of the DRAM currently installed.

The DRAM SIMM is at location UW20. The 4MB DRAM has ICs on only one side of the SIMM, and was standard on all 8100s shipped before April 1996; the 8MB DRAM has ICs on both sides of the SIMM, and is standard on all 8150s shipped after April 1996.

Framestore

The Framestore option is active if the Framestore sub-board is installed at location J7 as indicated. The 8150 will function without the Framestore sub-board installed.

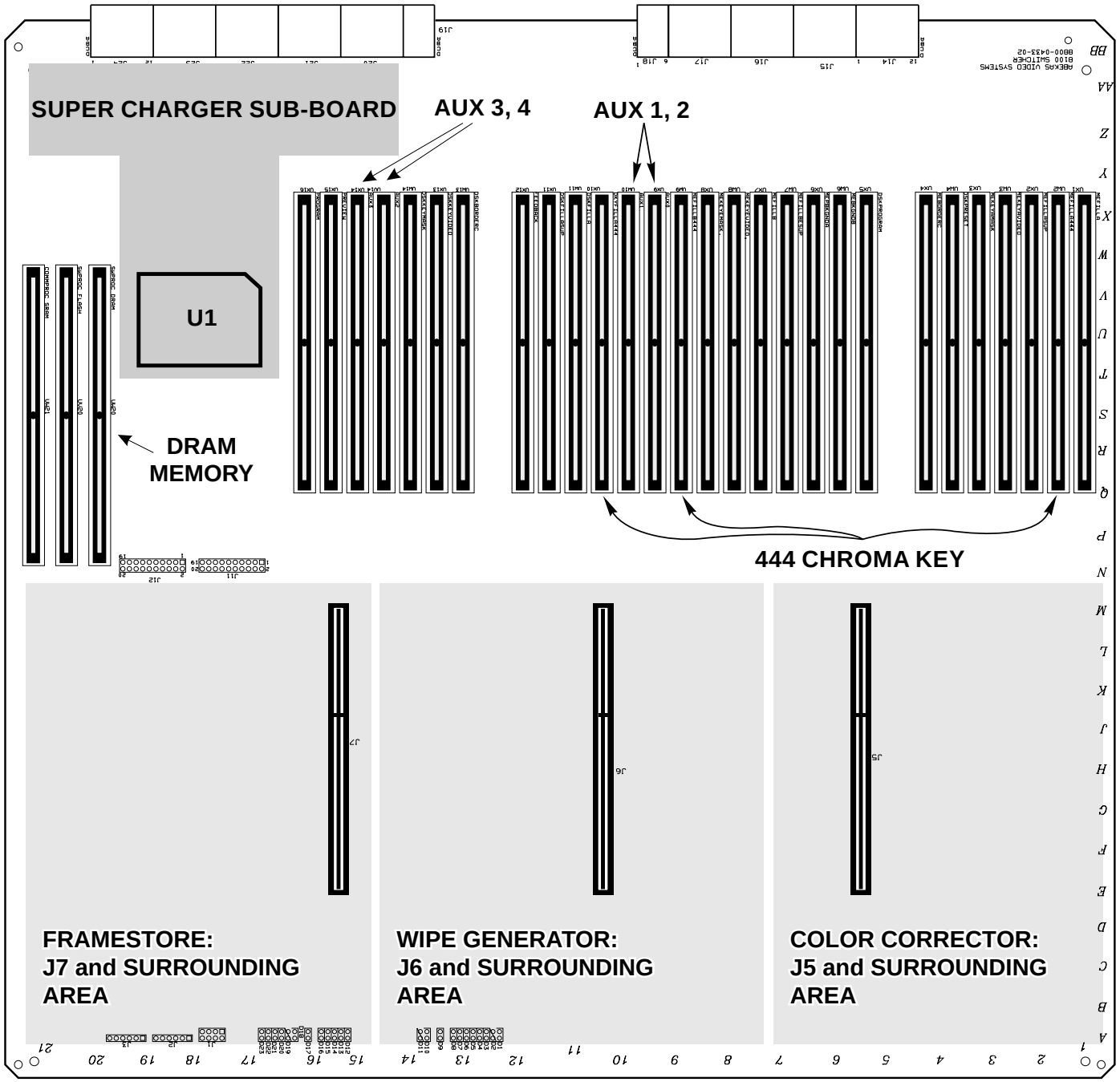


Figure 3-2 8150 Option Board Installation Locations

Wipe Generator

A Wipe Generator sub-board is required in the 8150 and is factory installed at location J6. Two versions are available: Standard and Advanced. You have the Standard Wipe Generator if some ICs are not installed on the sub-board; Advanced Wipe Generator boards are fully populated. In either case, a Wipe Generator sub-board must be installed for the 8150 to be able to perform transitions other than cuts.

Color Corrector

Either a Color Corrector Bypass sub-board or the Color Corrector sub-board is required and is factory installed at location J5. The Color Corrector Bypass sub-board completes M/E and PGM/PST bus row signal paths and lets the 8150 operate without color correction. This board is virtually devoid of parts. The Color Corrector sub-board is fully populated and enables all seven Color Correctors. In either case, a sub-board must be installed to complete the signal paths for the Background A, Background B, Program, and Preset buses.

Input Modules

There are five versions of Input modules currently available: Dual Serial Digital, Dual Parallel Digital, Dual Component Analog, Component Video + Key, and Composite Video + Key. Each version includes two inputs per board. The digital Input modules include a color field (matte) generator for each input, which you can use in place of the connected input signal. The Dual Component Analog module accommodates RGB or Y/R-Y/B-Y (at SMPTE/EBU N10, Betacam®, or MII® levels), monochrome key signals, or composite sync for video sources without

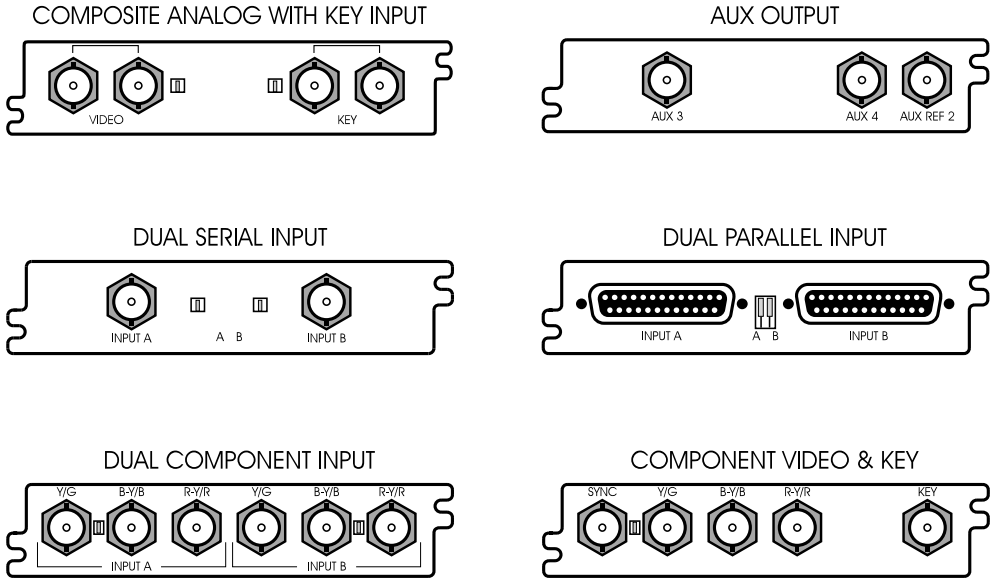


Figure 3-3 I/O Module Options

sync on G or Y. The Component Video + Key module supports one analog video input in any of the above formats (as well as wide band RGB, which it can sample at the 4:4:4 rate), plus one analog key input, both sampled at 10-bit resolution, plus a composite sync input if needed. The Composite Video + Key module supports one composite analog video (NTSC or PAL, depending on the line standard selected) input and one analog key (monochrome only) input.

There are eight input slots at the rear of the 8150 chassis, labeled 1/2, 3/4, etc. See Figure 3-4, below. The lower right hand slot (when viewed from the rear) is labeled 15/16 AUX 3/4. This indicates that this slot can be used either for inputs 15 and 16 or for Aux outputs 3 and 4 if that option is active. Since this slot can be used for only one module at a time, you can have two Aux outputs with a maximum of 16 inputs, or four Aux outputs with a maximum of 14 inputs.

You can install any version of Input module in any of these slots. Blank cover plates cover unused slots.

> **NOTE: It is important that any unused slots have a blank plate installed for proper cooling air flow inside the Signal Chassis.**

Hard Disk Drive

An optional 3.5" 1GB SCSI hard disk drive mounts on the floor of the Signal Chassis to the left of the power supply and in front of the backup battery. It is readily visible from the front of the chassis when you remove the front panel.

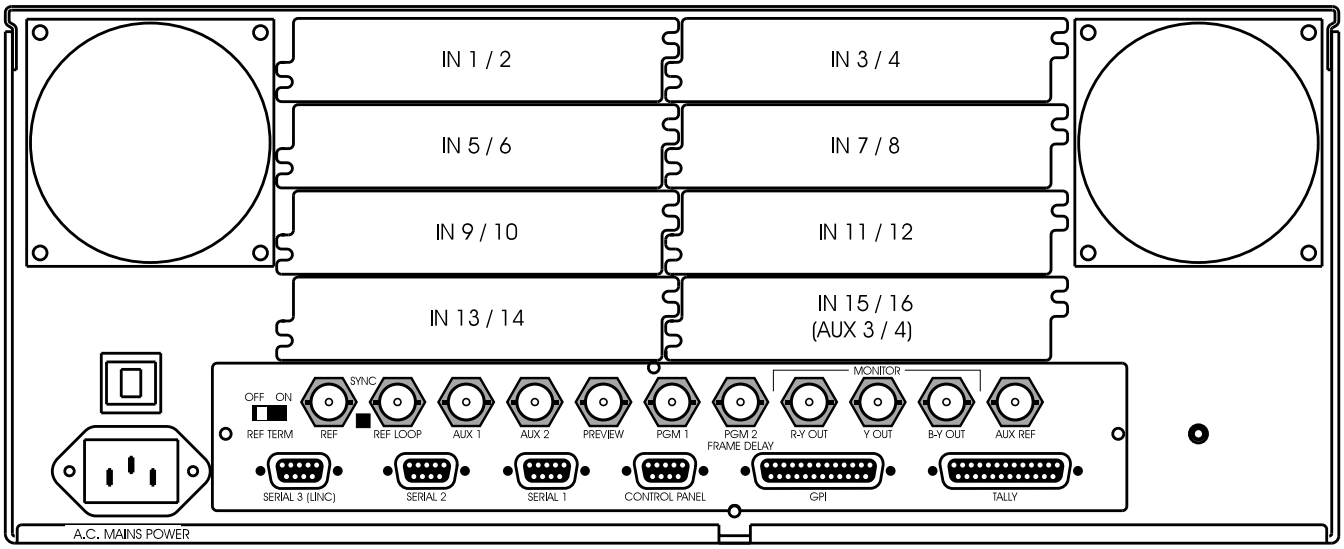


Figure 3-4 8150 Back Panel Connections

Option Installation

Aux Bus 1, 2

Before proceeding, ensure that you have two Accom SIMM type Delaystiks, Accom P/N 9400-0706.

WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.

STEP 1: Power down the 8150 Signal Chassis. Remove the integral front cover/air filter to access the 8150 Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and lay it on a clean, static free, grounded work surface.

NOTE: Seating the Delaystiks requires moderate pressure. Ensure that the Switcher board is sufficiently supported so it does not flex.

STEP 2: Install the Delaystiks in the SIMM sockets indicated in Figure 3-5, on the following page. Orient the Delaystiks like all the other Delaystiks installed on the Switcher board.

Lift the ejector lever all the way up before trying to seat the Delaystik. Otherwise, the lever prevents you from fully seating the Delaystik.

STEP 3: Use the Accom supplied tool to reseat the Switcher board in the 8150 Signal Chassis.

STEP 4: Power up the Signal Chassis. Assign a known video source to Aux buses 1 and 2 and confirm video is present at each output. Confirm that 1V p-p analog composite sync is present on the Aux Ref output.

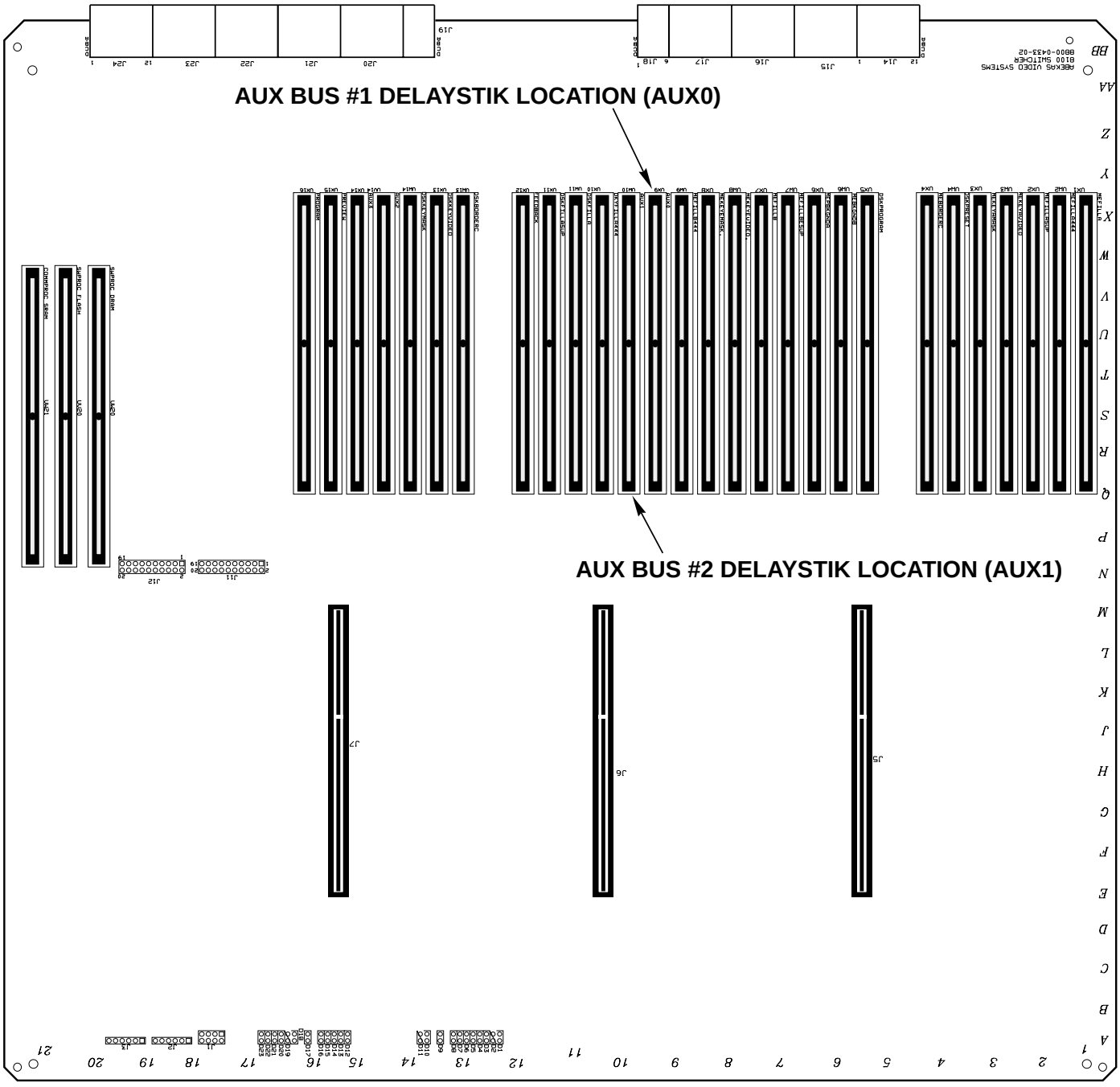


Figure 3-5 Aux Bus 1, 2 Delaystik Locations

Aux Bus 3, 4

Before proceeding, ensure that you have the following items:

- Two Accom SIMM type Delaystiks, Accom P/N 9400-0706
- One Aux 3, 4 Output module, Accom P/N 9400-0748

> **WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.**

STEP 1: Power down the 8150 Signal Chassis. Remove the integral front cover/air filter to access the 8150 Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and lay it on a clean, static free, grounded work surface.

> **NOTE: Seating the Delaystiks requires moderate pressure. Ensure that the Switcher board is sufficiently supported so as not to flex.**

STEP 2: Install the Delaystiks in the SIMM sockets indicated in Figure 3-6, on the following page. Orient the Delaystiks as all other Delaystiks installed on the Switcher board.

Lift the ejector lever all the way up before trying to seat the Delaystik. Otherwise, the lever prevents you from fully seating the Delaystik.

STEP 3: Remove the blank plate or Input module at the 15/16 AUX 3/4 slot at the rear of the chassis and install the Aux 3, 4 Output module in its place.

STEP 4: Use the Accom supplied tool to reseat the Switcher board in the 8150 Signal Chassis.

STEP 5: Power up the Signal Chassis. Assign a known video source to Aux buses 3 and 4 and confirm that video is present at each output. Confirm that 1V p-p analog composite sync is present on the Aux Ref output of this option module.

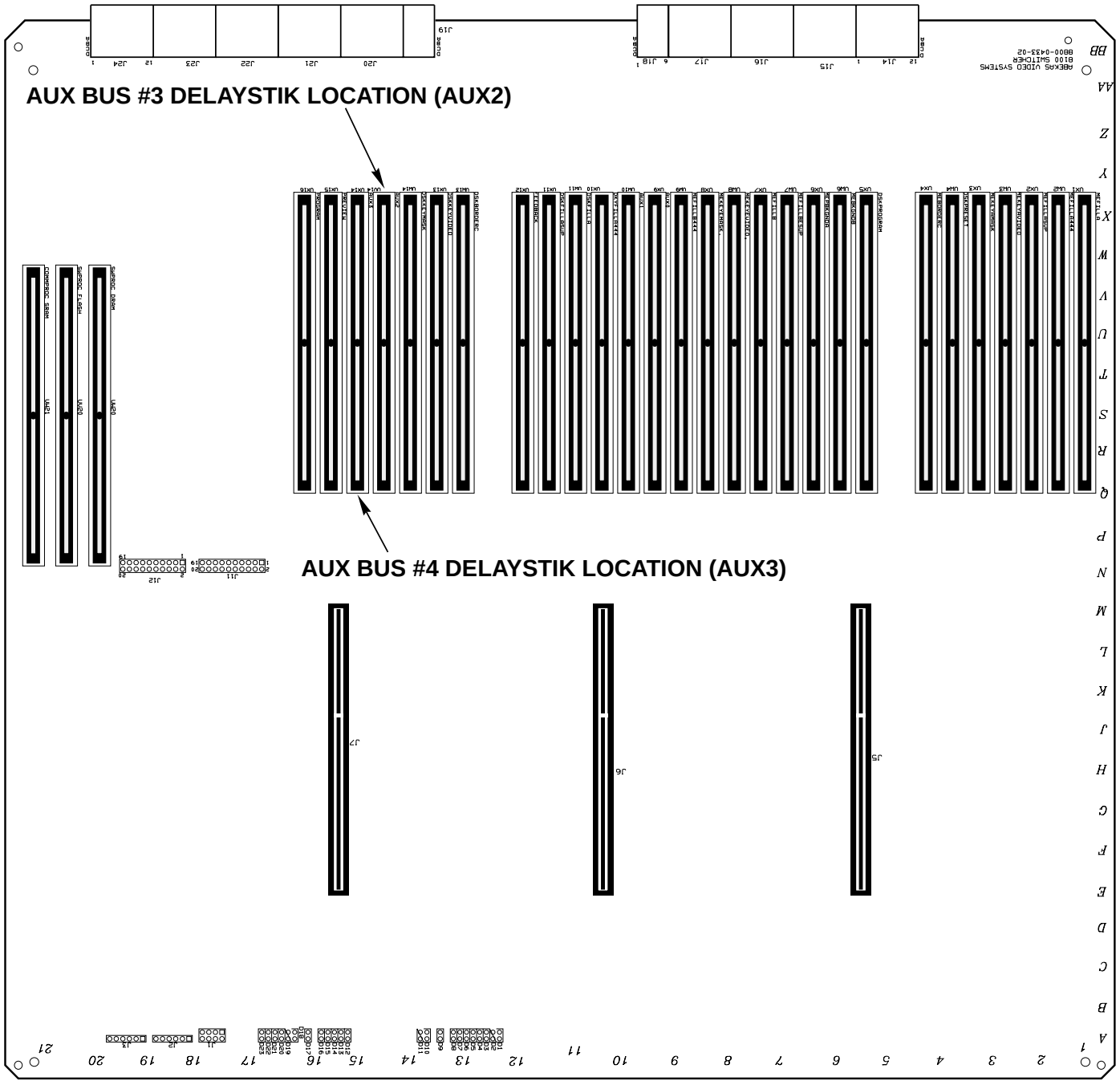


Figure 3-6 Aux Bus 3, 4 Delaystik Locations

DVE Board

Before proceeding, ensure that you have a Twin Channel DVE assembly, P/N 9400-0656, a Super Charger sub-board assembly, P/N 9400-0762, and a new boot PROM, P/N 8700-5078-02.

This procedure is for 8150s containing Switcher board assemblies at or above Revision 2.P, which began shipping in March 1996. If the revision sticker on the component side of the board near the edge connector shows Revision 2.O or below, you should contact Accom Customer Service about the 8150 Upgrade Kit.

WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.

STEP 1: Power down the 8150 Signal Chassis. Remove the integral front cover/air filter to access the 8150 Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and lay it on a clean, static free, grounded work surface.

STEP 2: Locate the Switcher Processor CPU IC (68EC030) at location UV17 on the Switcher board assembly. Using a small flat blade screwdriver, carefully remove this IC from its socket.

STEP 3: Install this IC at location U4 on the "T" shaped Super Charger sub-board assembly, shown in Figure 3-7, on the following page. Take care to align the dot in the upper left corner of the IC (pin 1) with the beveled edge of the silkscreen surrounding the socket at U4.

STEP 4: Install the Super Charger sub-board on the main Switcher board by inserting the pins at location U1 on the Super Charger sub-board into the now empty socket at location UV17 on the Switcher board.

STEP 5: Secure the Super Charger sub-board to the two standoffs near the edge connectors with the Phillips head screws provided.

STEP 6: Reinstall the Switcher board in its normal slot on the chassis (just above the power supply tray).

STEP 7: Install the DVE board into the topmost slot in the chassis. There will be an empty board slot between the Switcher and DVE boards.

STEP 8: From this point, update the software by following the instructions that came with the DVE Option Installation Kit.

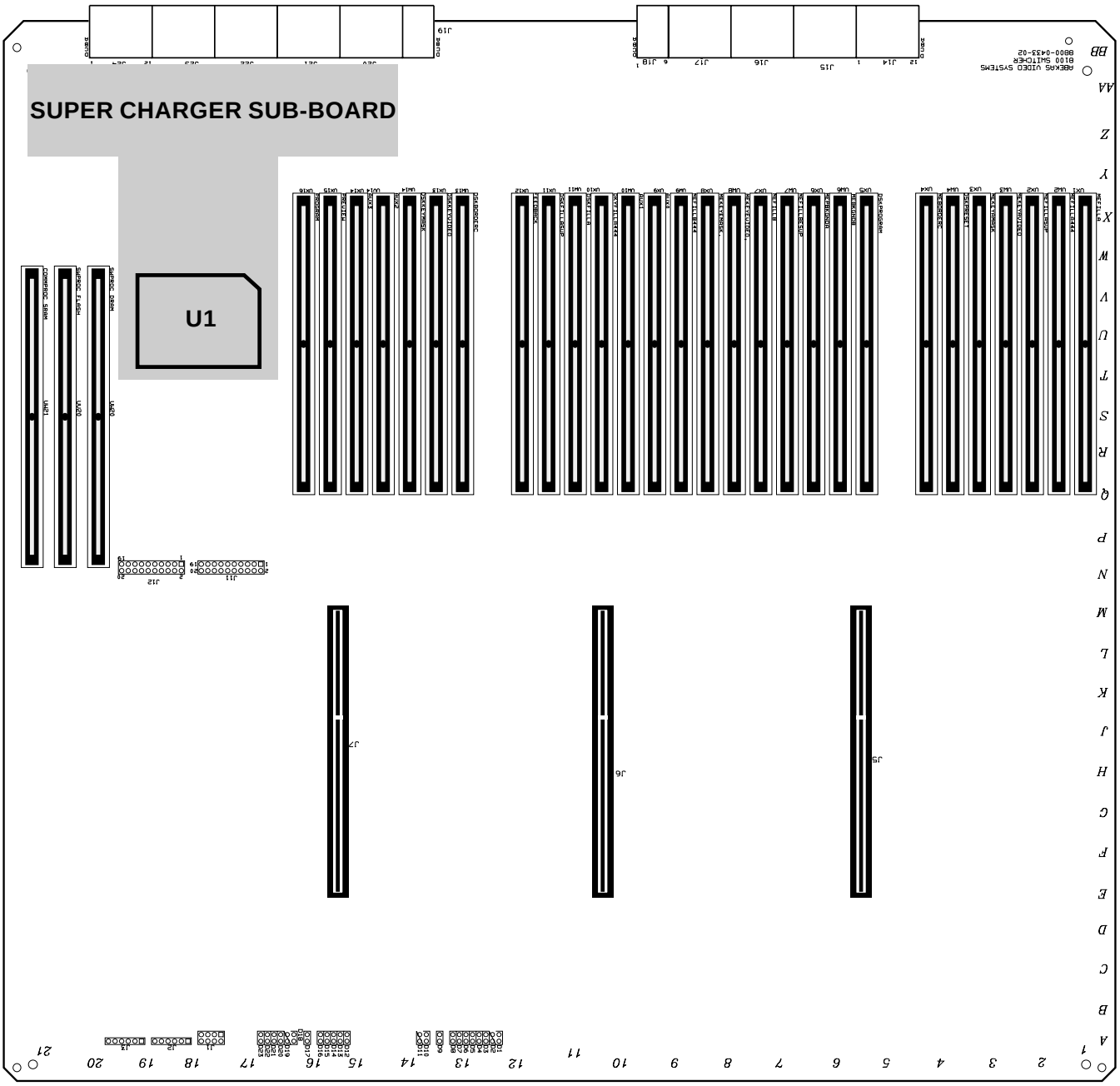


Figure 3-7 DVE Super Charger Sub-Board Location

4:4:4 Chroma Key

Before proceeding, ensure that you have three Accom SIMM type Delaystiks, Accom P/N 9400-0706.

> **WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.**

STEP 1: Power down the 8150 Signal Chassis. Remove the integral front cover/air filter to access the 8150 Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and lay it on a clean, static free, grounded work surface.

> **NOTE: Seating the Delaystiks requires moderate pressure. Ensure that the Switcher board is sufficiently supported so as not to flex.**

STEP 2: Install the Delaystiks in the SIMM sockets indicated in Figure 3-8, on the following page. Orient the Delaystiks as all other Delaystiks installed on the Switcher board.

Lift the ejector lever all the way up before trying to seat the Delaystik. Otherwise, the lever prevents you from seating the Delaystik fully.

STEP 3: Use the Accom supplied tool to reseat the Switcher board in the 8150 Signal Chassis.

STEP 4: Power up the Signal Chassis. In the Keyer menu for each keyer, press the ***Advanced Chroma Key*** softkey and verify that there are now four selections for the Key Type: ***Luma***, ***Single***, ***Dual***, and ***Chroma 444***. In the Color Corrector menus, the selections are ***YUV***, ***RGB***, and ***RGB 444***. However, you can only select ***RGB 444*** when the active Color Corrector is for one of the key fill signals (M/E Keyer 1, M/E Keyer 2, or DSK).

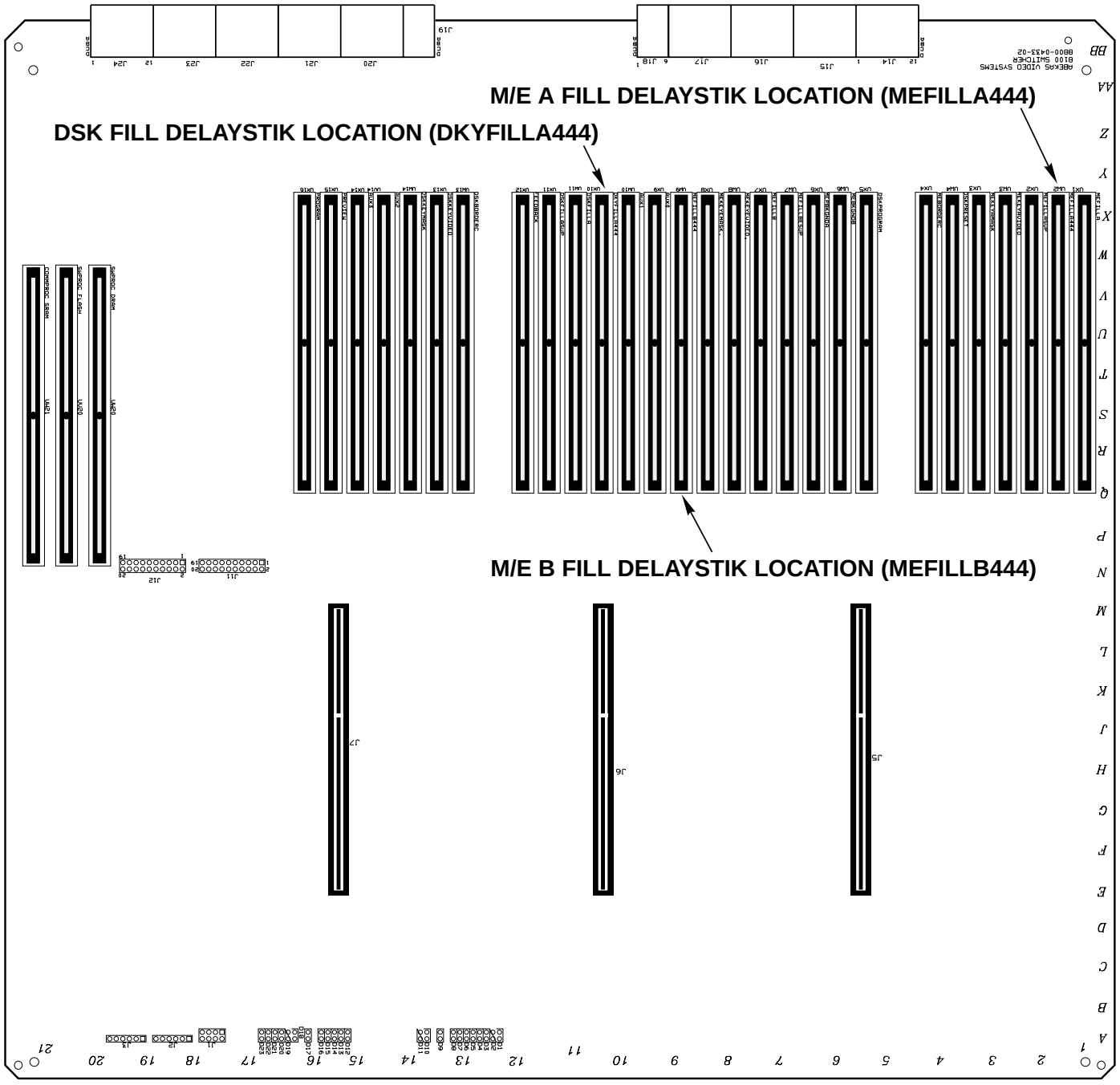

M/E A FILL DELAYSTIK LOCATION (MEFILLA444)
DSK FILL DELAYSTIK LOCATION (DKYFILLA444)
M/E B FILL DELAYSTIK LOCATION (MEFILLB444)

Figure 3-8 4:4:4 Chroma Key Delaystik Locations

STEP 5: SMPTE Proposed Recommended Practice RP 175 (Digital Interface for 4:4:4:4 Component Video Signals [Dual Link]) specifies de-multiplexing wide band digital 4:4:4 or 4:4:4:4 video signals into 4:2:2:0 and 0:2:2:4 pairs. This is for interconnecting to other devices using standard 4:2:2 connections, either serial or parallel digital. The 8150 requires that if the 4:4:4 signal is digital, it must be of the format YCbCr; it accepts YCbCrK, but does not process the Key part of the signal. (It cannot process digital GBR signals at the 4:4:4 sampling rate. However, if the Component Video + Key Input module is installed, it accepts either wide band RGB (GBR) or Y/R-Y/B-Y analog video.)

You can connect either part of the digital pair to any digital input on the 8150. Be sure to note which input is the 4:2:2 (link A, or luminance and co-sited color difference samples) part and which is the 0:2:2 (link B, or non-co-sited color difference samples) part. Since the 8150 does not process a key signal as a part of the 4:4:4 signal, the terms "4:2:2" and "0:2:2" appear below to indicate that key samples, if present, are not used.

STEP 6: You can select sources for the 4:4:4 Chroma Keyers in the Keyer menu Sources submenu. When the ***Key Type*** is ***Chroma 444***, two pushknobs labeled **Key 444 Cut Source #1** and **Key 444 Cut Source #2** appear. Select the input you connected the 4:2:2 (link A) part of the 4:4:4 signal to with the **Key 444 Cut Source #1** pushknob. Then select the input you connected the 0:2:2 (link B) part to with the **Key 444 Cut Source #2** pushknob.

NOTE: Since the high resolution chrominance portion of the 4:4:4 signal was sampled at twice the rate as a 4:2:2 signal, using only the 4:2:2 (link A) part of a 4:4:4 signal as a source may result in aliasing of the half-sample-rate color difference signals. The fill processor properly filters the 4:4:4 signal to 4:2:2 only when the *Key Type* is set to *Chroma 444* and the *Color Corrector Mode* is set to *RGB 444*. Since the Background A, Background B, Program, and Preset bus Color Correctors cannot accept 4:4:4 signals, you should use these signals only as chroma key fill sources in the 8150.

For more information on the 4:4:4 Chroma Keyers, see Section 4 – Keying in the 8150 Operations Manual.

Dual Framestores

Before proceeding, ensure that you have the Framestore sub-board, Accom P/N 9400-0649. The mounting hardware should already be present on the Switcher board. Figure 3-9, below, shows the major components on the Framestore sub-board and the assembly number for identification.

WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.

STEP 1: Power down the 8150 Signal Chassis. Remove the integral front cover/air filter to access the 8150 Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and lay it on a clean, static free, grounded work surface.

NOTE: Seating the sub-board requires moderate pressure. Ensure that the Switcher board is sufficiently supported so as not to flex.

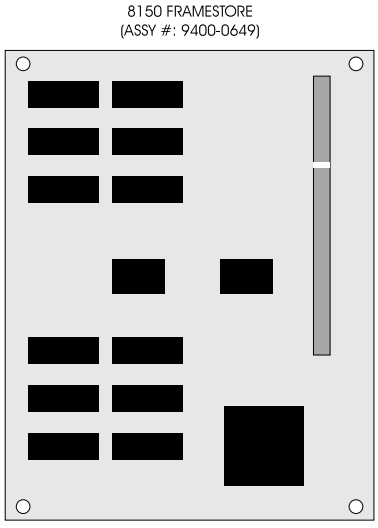


Figure 3-9 Framestore Sub-Board

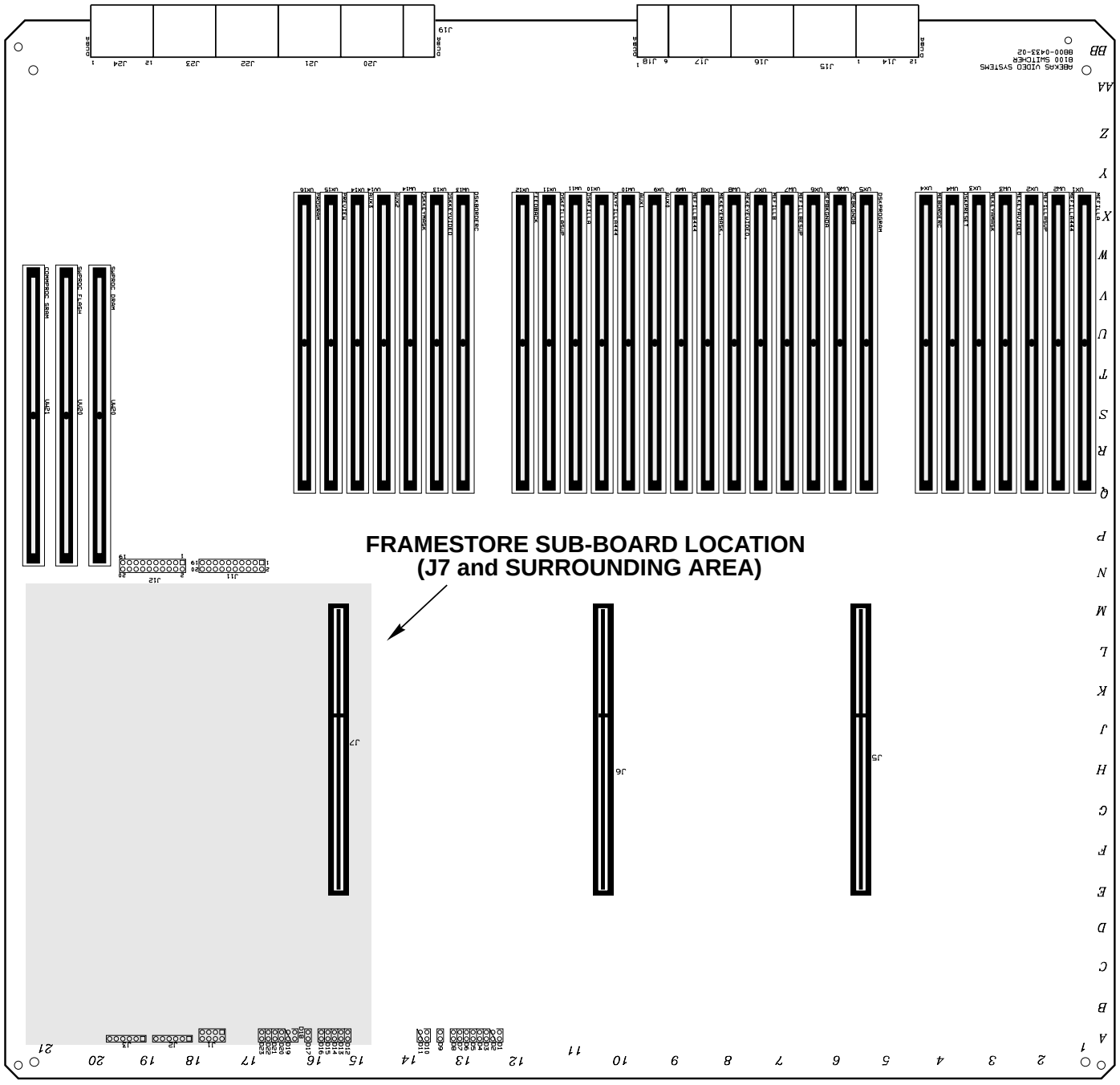


Figure 3-10 Framestore Sub-Board Location

STEP 2: See Figure 3-10, on the previous page, to locate the Framestore sub-board (J7 and surrounding shaded area). Note the orientation notch in J7 and orient the Framestore sub-board to match. Seat the sub-board on the connector and press gently but firmly directly over the connector area so as not to unduly flex the Switcher board. Fix the standoff fastening screws to secure the sub-board. Use the Accom supplied tool to reseat the Switcher board in the 8150 Signal Chassis.

STEP 3: Power up the Signal Chassis. Select Framestore 1 as the source for the program or preview outputs, and select a video source as the input to Framestore 1. See the Operations Manual for more information. Verify that you can freeze the selected video in Framestore 1.

STEP 4: Repeat the above step for Framestore 2.

Standard or Advanced Wipe Generator

Before proceeding, ensure that you have the correct sub-board; the Standard Wipe Generator board is Accom P/N 9400-0708; the Advanced Wipe Generator board is Accom P/N 9400-0681. Figure 3-11, below, shows the major components on both Wipe Generator sub-boards and their assembly numbers for identification.

WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.

STEP 1: Power down the 8150 Signal Chassis. Remove the integral front cover/air filter to access the 8150 Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and lay it on a clean, static free, grounded work surface.

NOTE: Seating the sub-board requires moderate pressure. Ensure that the Switcher board is sufficiently supported so as not to flex.

STEP 2: See Figure 3-12, on the following page, to locate the Wipe Generator sub-board (J6 and surrounding shaded area). Remove the screws securing the installed Wipe Generator sub-board to the Main board, then remove the sub-board.

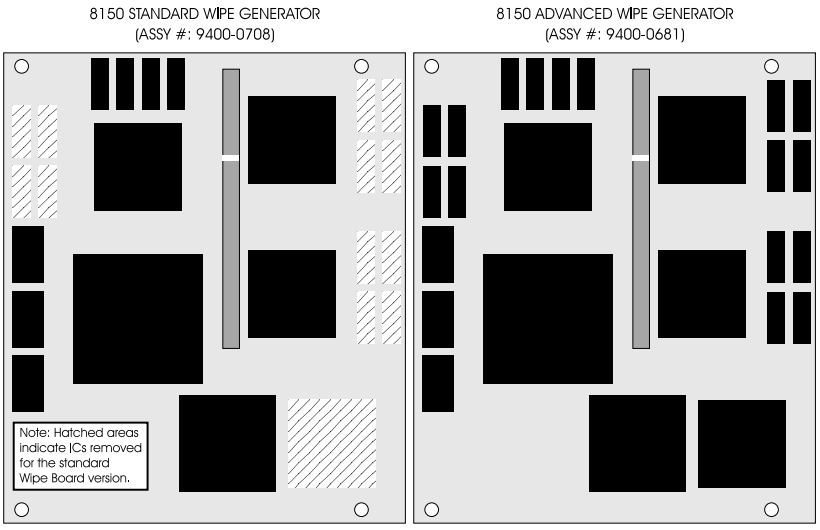

8150 STANDARD WIPE GENERATOR
(ASSY #: 9400-0708)
8150 ADVANCED WIPE GENERATOR
(ASSY #: 9400-0681)
Note: Hatched areas indicate ICs removed for the standard Wipe Board version.

Figure 3-11 Standard (Left) & Advanced (Right) Wipe Generator

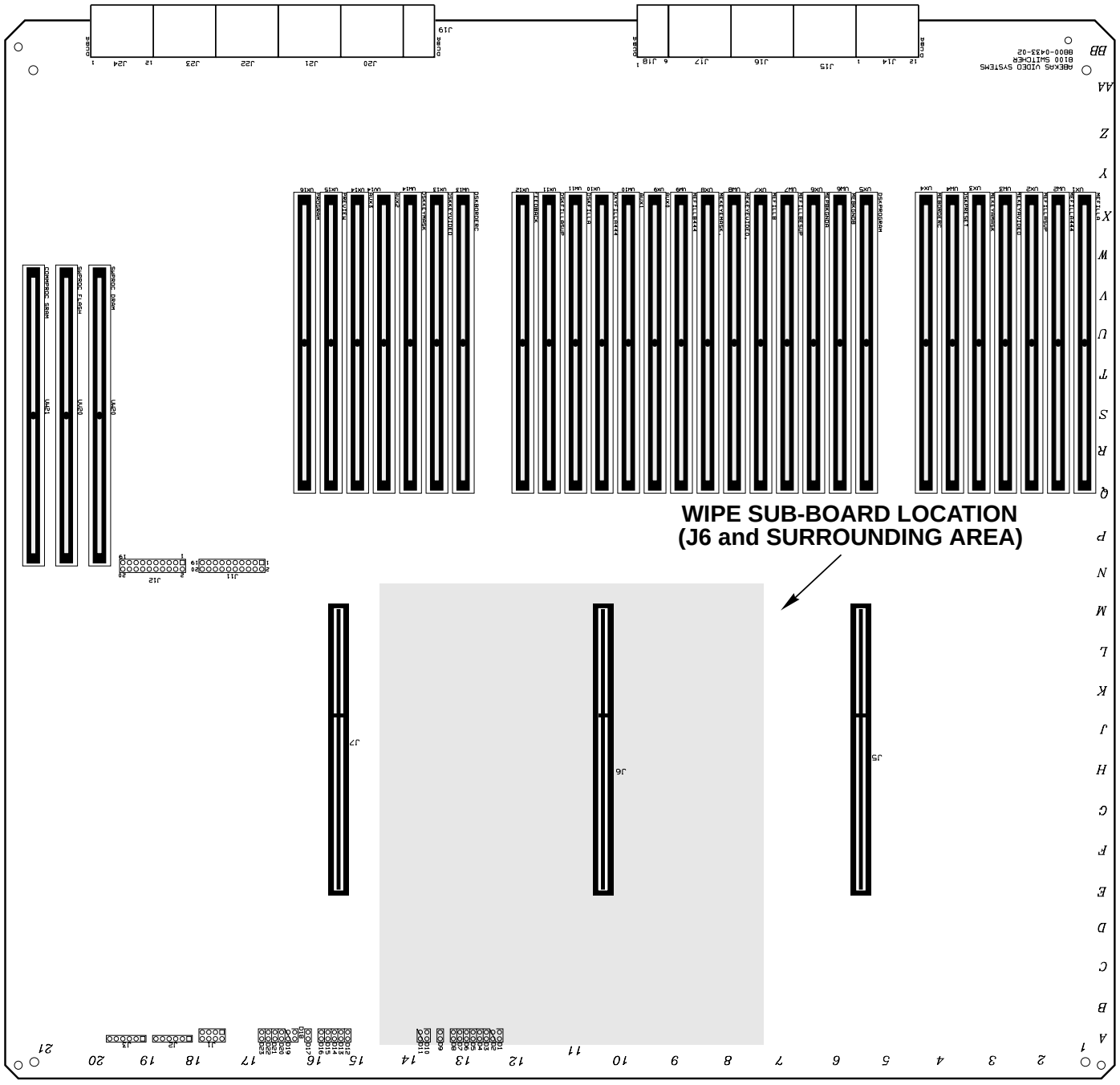


Figure 3-12 Wipe Generator Sub-Board Location

STEP 3: Note the orientation notch in J6 and orient the replacement Wipe Generator sub-board to match. Seat the sub-board on the connector and press gently but firmly directly over the connector area so as not to unduly flex the Switcher board. Fix the standoff fastening screws to secure the sub-board. Use the Accom supplied tool to reseat the Switcher board in the 8150 Signal Chassis.

STEP 4: Power up the Signal Chassis. Perform wipes on the M/E and PGM/PST buses to verify proper operation. Select the SuperMatte generator as a source and adjust it to verify that it is present.

Color Corrector/Color Corrector Bypass

Before proceeding, ensure that you have the correct sub-board; the Color Corrector board is Accom P/N 9400-0648; the Color Corrector Bypass board is Accom P/N 9400-0731. Figure 3-13 shows the major components on both sub-boards and their assembly numbers for identification.

WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.

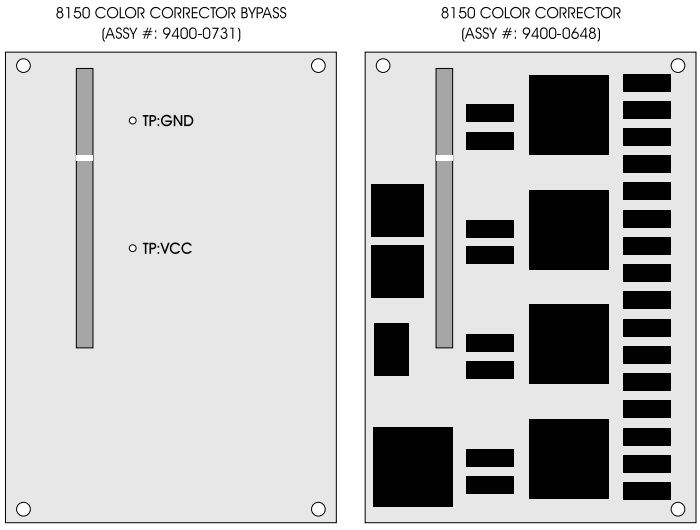


Figure 3-13 CCR Bypass (Left) & CCR (Right) Sub-Boards

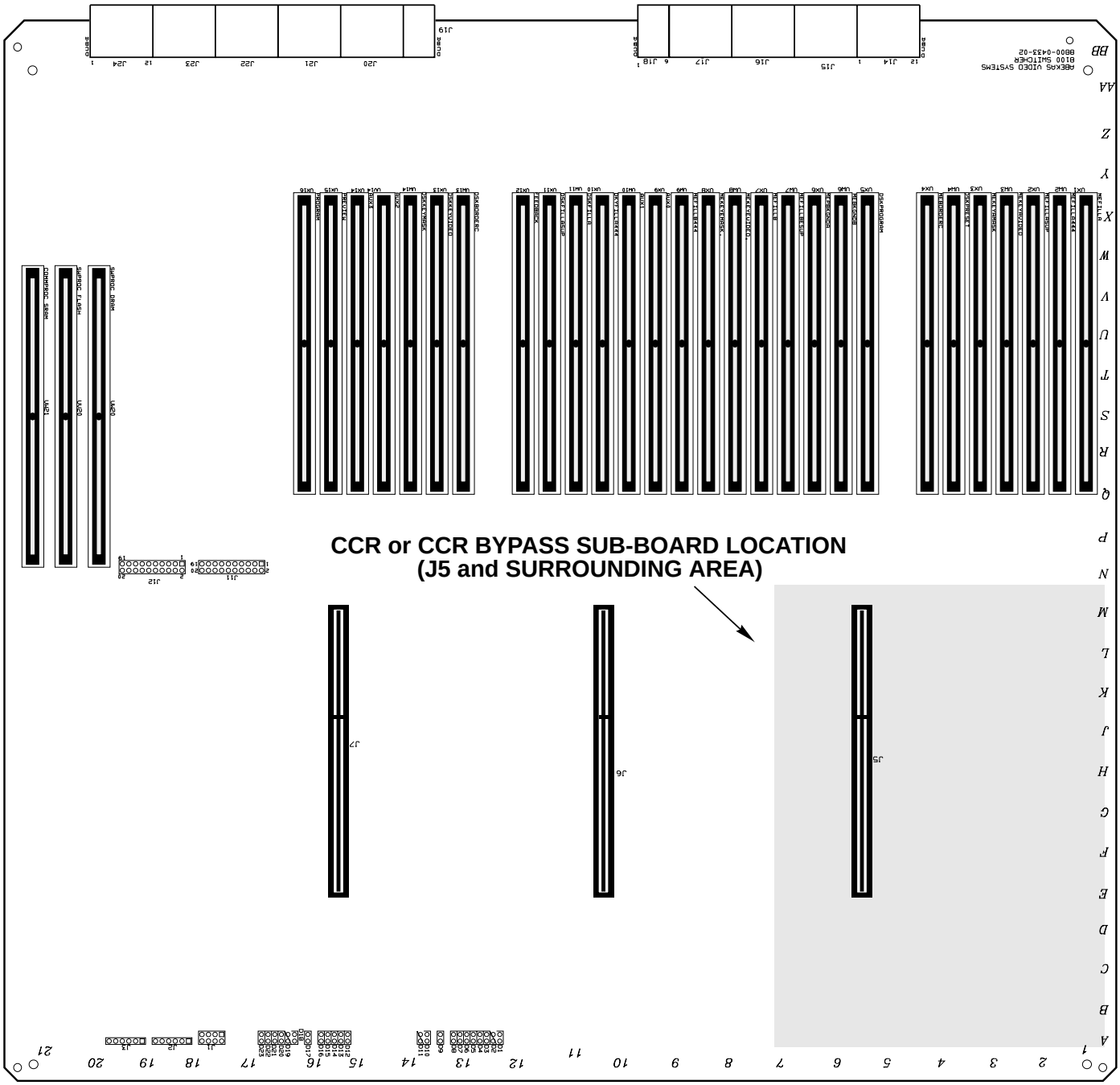


Figure 3-14 Color Corrector Sub-Board Location

Input Modules

Before proceeding, ensure that you have the necessary Input module(s) and/or blank plate(s) to install in all empty slots. These are the Accom part numbers:

- Dual Serial Digital Input, Accom P/N 9400-0675
- Dual Parallel Digital Input, Accom P/N 9400-0669
- Dual Component Analog Input, Accom P/N 9400-0667
- Component Video + Key Input, Accom P/N 9400-0687
- Blank plate, Accom P/N 8900-0976-03

> **NOTE: If you are installing the Component Video + Key Input module, there are some jumper settings that you may need to change before installation. See Section 4 – System Overview for information on these jumpers.**

STEP 1: Power down the 8150 Signal Chassis. Remove the two screws securing the Input module or blank plate currently installed in the slot at which you wish to install the new module.

STEP 2: Remove the Input module or blank plate from the slot and replace it with the new Input module. Gently slide the module into place along the built-in card guides. It should seat easily but firmly into place on the Motherboard.

> **NOTE: If there is no module in an input slot, install a blank plate over the slot to prevent cooling problems caused by air being drawn in the rear instead of the front of the chassis. Extra blank plates were included with the manuals, etc. that shipped with your 8150.**

STEP 3: Power up the Signal Chassis. Connect signals to the new inputs and verify that they appear correctly when selected. Note that on power-up, each Input module identifies itself to the 8150 Switcher CPU. If there is no module installed in a slot, those inputs do not appear in the Personality menu Input Names submenu list. We recommend that you install all Input modules in the Signal Chassis when you create the Input Names and save them to disk.

Extended Memory

Before proceeding, ensure that you have an 8MB DRAM SIMM, Accom P/N 3119-0005.

WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.

STEP 1: Power down the 8150 Signal Chassis. Remove the integral front cover/air filter to access the 8150 Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and lay it on a clean, static free, grounded work surface.

NOTE: Seating the DRAM SIMM requires moderate pressure. Ensure that the Switcher board is sufficiently supported so it does not flex.

STEP 2: Remove the 4MB DRAM SIMM at location UW20 indicated in Figure 3-15, on the following page, by lifting the ejector lever all the way up. One end of the SIMM is notched. Note the end of the socket this SIMM end was installed in.

STEP 3: Lift the ejector lever all the way up before trying to seat the 8MB DRAM SIMM. If you do not lift the lever, it prevents you from fully seating the SIMM in its socket.

STEP 4: Use the Accom supplied tool to reseat the Switcher board in the 8150 Signal Chassis.

STEP 5: Power up the Signal Chassis. When it boots up, press the **SHOW STATUS** button. In the upper right hand System Display box, the Memory readout should be 8MB. The 8150 can now store 100 Timeline effects in on-line memory, and the enhanced chroma key auto setup function is now active.

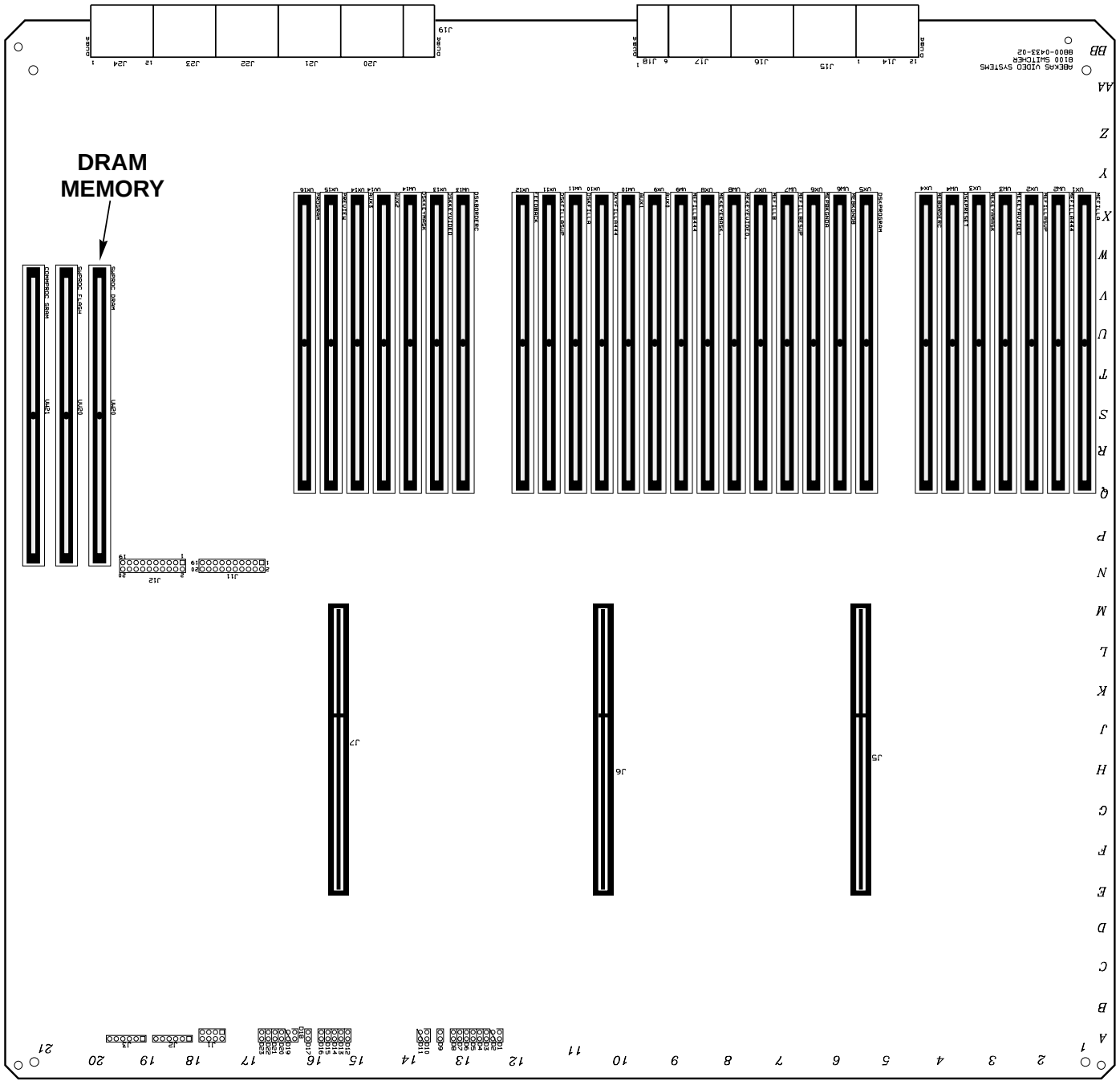


Figure 3-15 DRAM Memory Location

Hard Disk Drive

Installing this option requires access to the bottom side of the Signal Chassis. If it is installed in a rack that does not allow screwdriver access to the chassis bottom, remove it from the rack and place it on a suitable workbench.

Before proceeding, ensure that you have the following items:

- One 3.5" 1GB SCSI disk drive, Accom P/N 1600-0075 (initialized and formatted by Accom).
- One 50-way ribbon cable, Accom P/N 9000-0518-00.
- One 4-way power cable, Accom P/N 9000-0515-01.
- Four 6-32 x 1/4" Phillips screws, Accom P/N 1901-0071.
- Four 5/16" diameter #6 Star washers, Accom P/N 1901-0182.

WARNING: Removing the Switcher board disconnects the RAM battery backup. Save all effects, timelines, personality files, and engineering setups to disk before extracting the board.

STEP 1: Power down the Signal Chassis. Remove the integral front cover/air filter to access the Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and set it aside on a clean, static free surface.

STEP 2: If you originally received your 8100 (or 8150) during or after March 1995, skip to step 4. If you received your 8100 during or before February 1995, use the next step to verify that a modification is in place.

STEP 3: On the component (top) side of the Switcher board, locate the voltage regulator at location UAA20. Verify that its heatsink faces up, away from the circuit board, and that the silkscreened side of the component faces the circuit board. If so, the modification is present. If the regulator at UAA20 has the heat sink facing the board and the silkscreen facing away from the board, it must be modified for the SCSI circuitry to work properly. Contact Accom for an update kit at no charge.

NOTE: The SCSI update involves inverting the voltage regulator and changing two surface-mount resistors. If you do not feel comfortable making these modifications yourself, contact Accom Customer Service to arrange an exchange or on-site service call.

STEP 4 Connect the 4-way power harness to Motherboard connector J35 (directly behind the backup battery) and bring the other end of the cable to the front of the chassis.

STEP 5: Connect the 50-way SCSI ribbon cable to Motherboard connector J19 (above J35) and bring the other end of the cable to the front of the chassis.

STEP 6: Place the hard disk drive in the chassis on top of the ribbon cable. Pull the ribbon cable forward to draw any slack to the front of the disk drive. Place the disk drive circuit board side down, with the 50-way and 4-way connectors facing toward the front. Route the disk drive power harness under the main DC power harness and down the right-hand side of the disk drive.

STEP 7: Connect the ribbon cable and power harness to the disk drive.

STEP 8: Secure the disk drive from under the chassis with four 6-32 x 5/16" screws and #6 star washers.

STEP 9: Install the shorting jumper on the Switcher board at location JP3.

STEP 10: Reinstall the Switcher board in the chassis and power up the unit.

NOTE: It takes approximately ten seconds for the hard drive to spin up to operating speed after a power cycle. This creates a short delay in accessing the Disk menu for the first time after a power cycle.

STEP 11: When the unit boots up, press the **DISK** menu button to access the Disk menu. Toggle the ***Drive*** softkey to ***Hard Drv***. The status box message should be **<no files>**. The prompt under the central status box should read:

```
path: C:
disk size: 1079736800 [approximately]
disk free: 1079736800 [approximately]
```

Since the hard drive is initialized and formatted at the factory, it is ready for use. You can save and recall files to this disk drive just like the floppy drive. This includes image files, and the drive can save and recall full frames of video (YUV and Y10 files) in about three seconds. See Section 11 – Disk Operations in the 8150 Operations Manual for information on creating subdirectories and saving files to the hard drive.

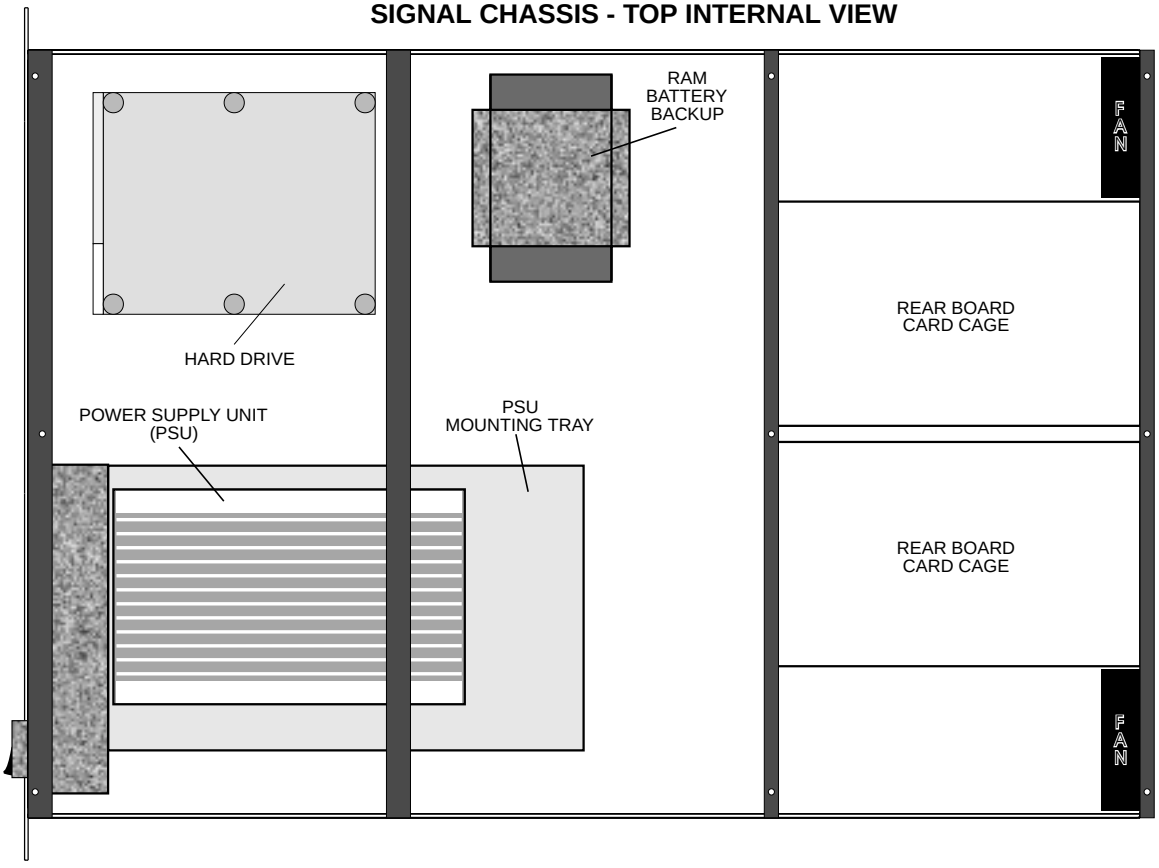


Figure 3-16 8150 Signal Chassis

Section 4

System Overview

This section describes the major Signal Chassis physical assemblies and the LED indicators for the 8150 Main Circuit board, the optional DVE board, and the Input and Output modules. You will also find a brief discussion of the Control Panel buttons and their locations.

Signal Chassis

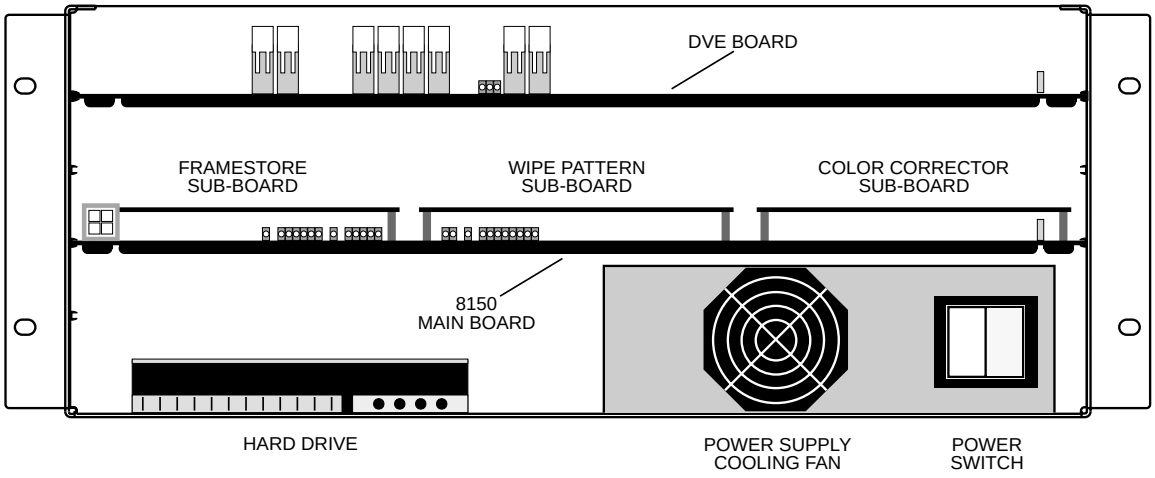
See Figure 4-1, on the facing page, in reference to the descriptions below.

Major Assembly Locations

The Signal Chassis front internal view shows the locations of the 8150 Main Circuit board, the optional DVE board, and the subboards. Note that there may not be a DVE board or framestore subboard installed in your system. See Section 3 – Options for more information.

The Signal Chassis top internal view shows the locations of the power supply, RAM battery backup assemblies, and optional hard disk drive.

SIGNAL CHASSIS - FRONT INTERNAL VIEW



SIGNAL CHASSIS - TOP INTERNAL VIEW

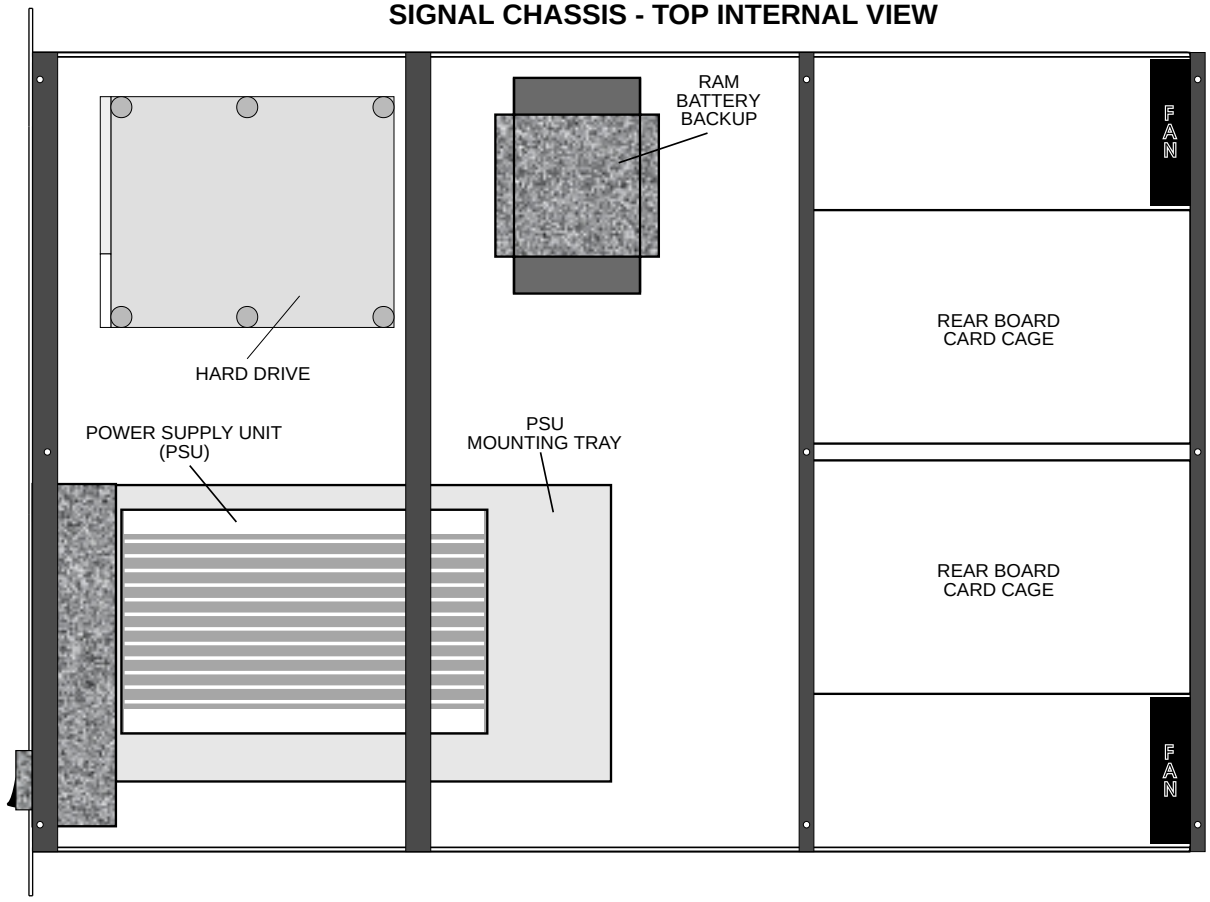


Figure 4-1 8150 Signal Chassis Major Components

Main Board Indicators

See the drawing on the facing page in reference to the descriptions below.

D1 - D8 YELLOW ADDRESS BUS ACTIVITY
These LEDs show activity on the eight MSBs of the Address bus.

D9 GREEN VIDEO STANDARD
When this LED is lit, 525-line operation is selected. If it is off, 625-line operation is selected.

D10 GREEN RUN
This LED is normally lit while the switcher processor is active, and goes off while the processor is halted.

D11 GREEN SWITCHER PROC ADDRESS STROBE
This LED lights to indicate that the switcher processor address strobe is active.

D12 GREEN DEBUG PORT TX
Factory test only.

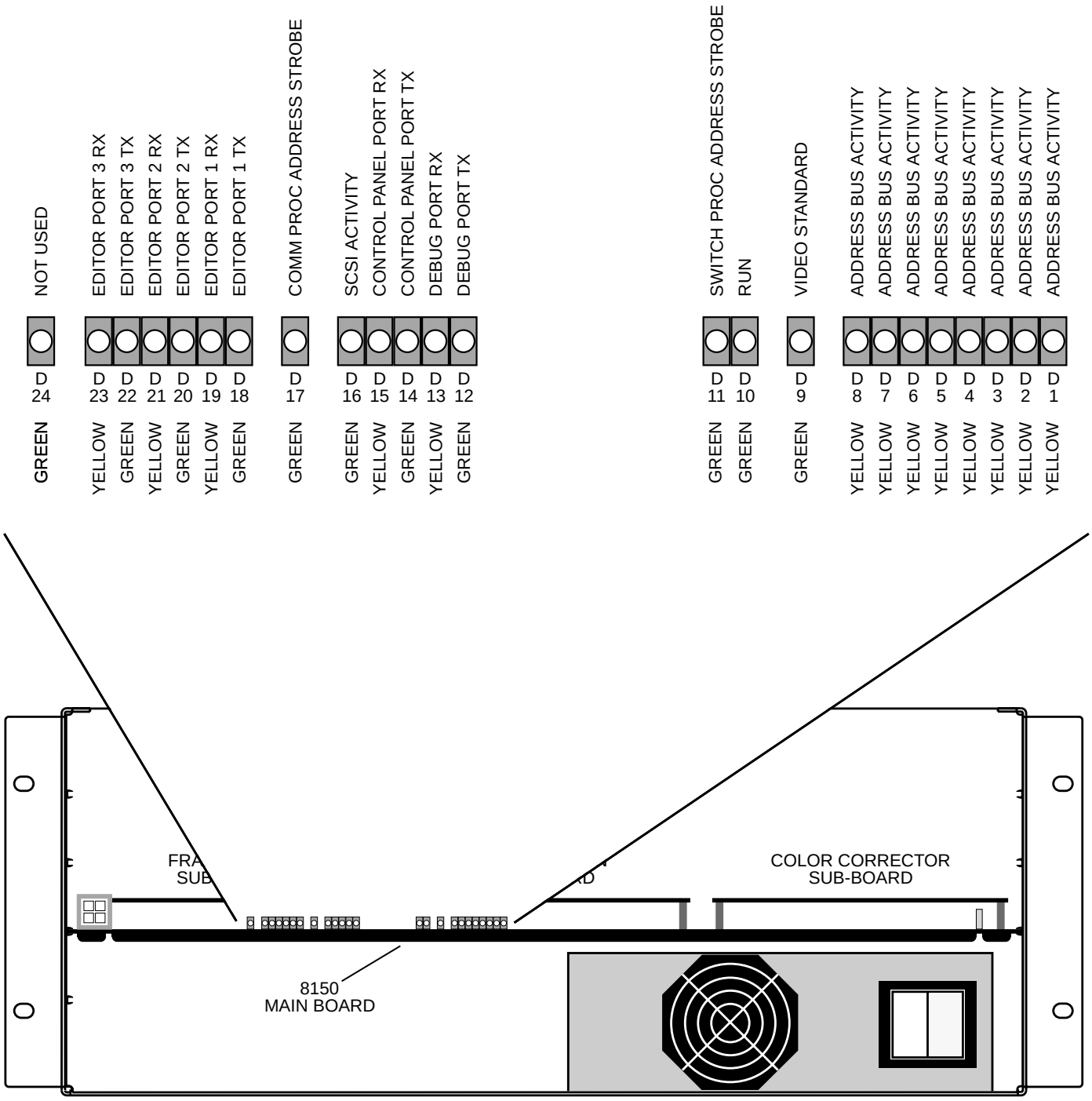
D13 YELLOW DEBUG PORT RX
Factory test only.

D14 GREEN CONTROL PANEL PORT TX
This LED normally flashes to indicate that the Signal Chassis is transmitting data to the Control Panel.

D15 YELLOW CONTROL PANEL PORT RX
This LED normally flashes to indicate that the Signal Chassis is receiving data from the Control Panel.

D16 GREEN SCSI ACTIVITY
This LED flashes to indicate that the 8150 is accessing its SCSI hard disk drive.

D17 GREEN COMM PROC ADDRESS STROBE
This LED lights to indicate that the communications processor address strobe is active.



SIGNAL CHASSIS - FRONT INTERNAL VIEW

Figure 4-2 8150 Main Board LEDs

D18 GREEN EDITOR PORT 1 TX
This LED normally flashes to indicate that Serial Port 1 is transmitting data.

D19 YELLOW EDITOR PORT 1 RX
This LED normally flashes to indicate that Serial Port 1 is receiving data.

D20 GREEN EDITOR PORT 2 TX
This LED normally flashes to indicate that Serial Port 2 is transmitting data.

D21 YELLOW EDITOR PORT 2 RX
This LED normally flashes to indicate that Serial Port 2 is receiving data.

D22 GREEN EDITOR PORT 3 TX
This LED normally flashes to indicate that Serial Port 3 is transmitting data.

D23 YELLOW EDITOR PORT 3 RX
This LED normally flashes to indicate that Serial Port 3 is receiving data.

D24 GREEN NOT USED

Input Module Indicators

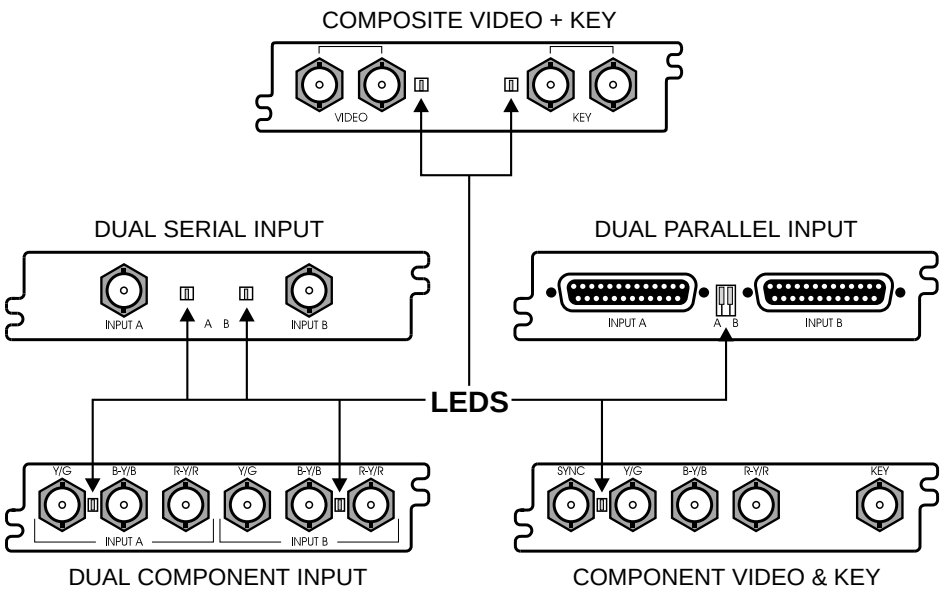


Figure 4-3 Input Module LED Locations

The Input modules have dual color LEDs that indicate the input signal status. See the following table.

LED Color	Digital Input Module Status	Analog Input Module Status
OFF	No input signal present	(Does not apply)
RED	(Does not apply)	No input sync present
YELLOW	Input signal unlocked or does not match selected line standard	Input sync unlocked or does not match selected line standard
GREEN	Input signal present and locked	Input sync present and locked

Output Module Indicators

The standard and optional Frame Delay Output modules each have a dual color LED that indicates the reference status.

LED Color	Reference Status
RED	No reference present
YELLOW	Reference present but does not match selected line standard
GREEN	Reference present at selected line standard

Component Analog + Key Module Jumpers

The optional Component Analog + Key Input module supports one dedicated component video input and one dedicated key input. Sync is expected on the Y/G component of the video signal, and on the key signal. However, if you need to input a video signal that does not have sync, the module has a separate sync input for this purpose.

There are three jumpers on this module for selecting of Y/G sync or separate sync, for terminating or unterminating the separate sync signal, and for selecting the level of sync on the key signal. The following table describes the functions and settings for each jumper.

Jumper	Function	Pin Connections
JP1	Selects level of the sync on key input	1-2 = 300mV sync (default) 2-3 = 2V/4V sync
JP2	Selects sync on video or separate sync	1-2 = video sync (default) 2-3 = separate sync
JP3	Terminates or unterminates the separate sync input	1-2 = 75-ohm term (default) 2-3 = hi-z termination

DVE Board (Option)

Overview

The optional DVE board provides frame-based, 10-bit video processing. This processing includes image sizing, positioning, rotation, warps, light sourcing, textures, and drop shadows. One of the unique features of the 8150 DVE option is its flexible channel configuration. The board comes with two channels: one main channel dedicated for video, and a second channel that can be used for video, key, or shadow. The A video transformation path is a full bandwidth video channel. The B channel can process key signals (luminance only), but is also a full bandwidth video channel. This lets the DVE board operate in three modes:

Video/Video Mode

In the Video/Video mode, the DVE board acts as two identical video-only DVE channels, each processing a full 4:2:2 video path. Each channel has a video input and a texture source input with dedicated freeze buffers. The texture inputs feed each channel's light source model, where the textures are applied to the light source calculations. The video inputs feed the border/crop processing, then pass to their respective light source models. Then the light source, including texture, is applied to each image.

Each channel has its own independent transform controller, which generates addressing for the main transform framestore and filter coefficients for the horizontal and vertical bandwidth filters. The video for each channel is filtered and then passed to the motion detection and vertical upsampling circuitry. From here the video is written into the main transform framestores.

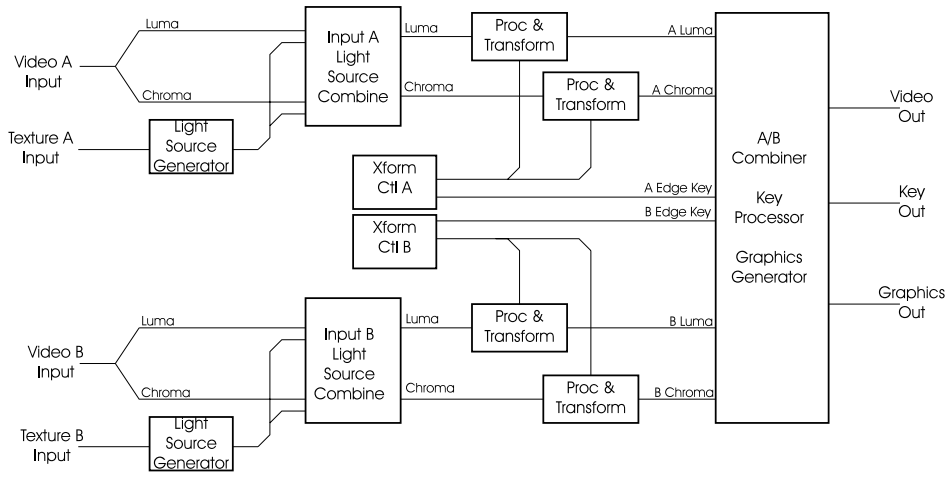


Figure 4-4 The DVE Board in Video/Video Mode

The video for each channel is read out of the transform framestores, with addresses generated by that channel's transform controller, and sent to the output interpolators. The transformed video and generated key information from each channel passes to the combiner, which composites the two channels together.

The combining process uses either a fixed key priority (A over B or B over A) or a Z (depth) based key priority. In Z key mode, the Z position of each channel in 3D space determines its priority relative to the other channel.

The graphics output consists of axis grids and channel identifiers for each channel.

Video/Key Mode

The Video/Key mode differs from the Video/Video mode only in that the board processes the B channel as the key signal for the A channel, with additional key clip, gain, and horizontal phase adjustments. Note that the chrominance processing of the B channel is not used in this mode since key signals have luminance information only. This makes the A channel 4:2:2 and the B channel 4:0:0.

The A/B Combiner's key output is effectively that of the B channel, and not the raster-based signal seen in the Video/Video mode. Since the key (B) transform can be independent of the video (A) transform, it is possible to position the transformed key so that the transformed video is not visible, or only partly visible, in the final composited output.

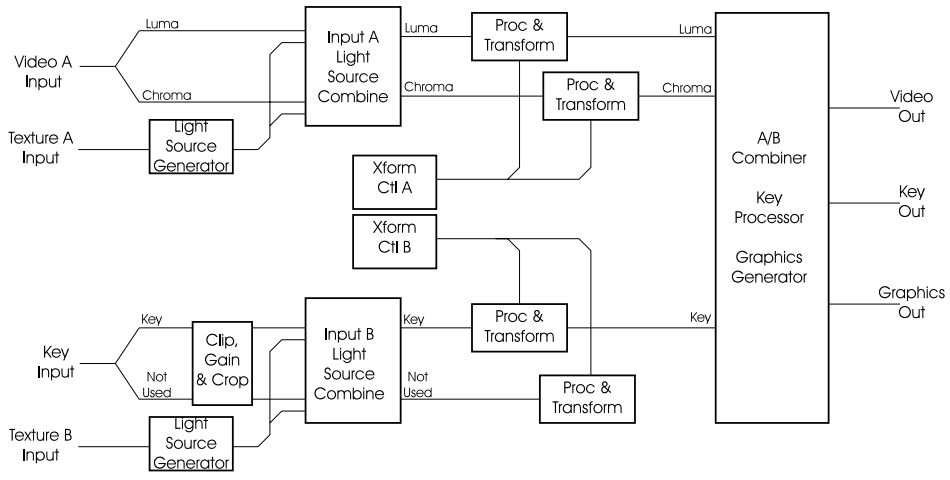


Figure 4-5 The DVE Board in Video/Key Mode

Video-Key/Shadow Mode

The Video-Key/Shadow mode is similar to the Video/Key mode, except that the key signal input to the B channel is processed by the A channel's transform controller, so that the video and key are transformed identically. Also, the key input is used to create a drop shadow. The drop shadow is routed through the chrominance part of the B circuitry, and processed by the B channel's transform controller, which provides independent shadow transform control. Although the actual signal paths are the same as in Video/Video mode, from an operational point of view, the A channel is a 4:2:2:4 path and the B channel is a 4:0:0 path.

The A/B Combiner key output in this mode is a combination of the key shadow signals processed by the B channel.

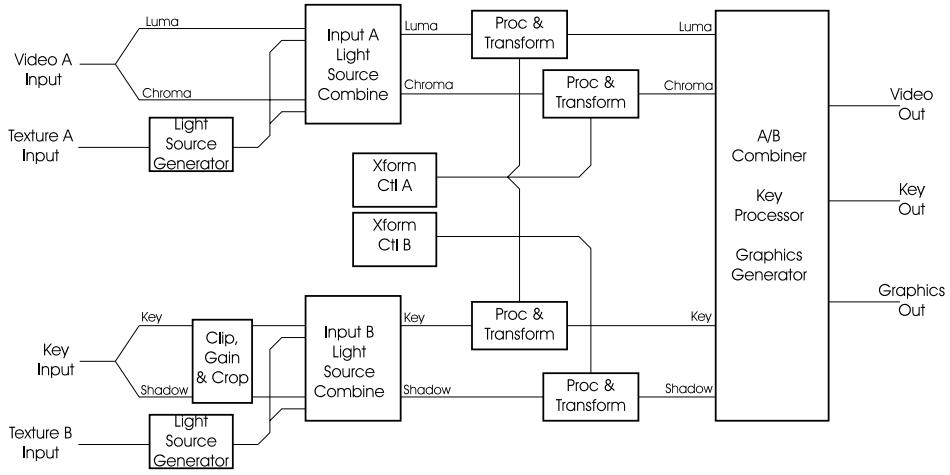


Figure 4-6 The DVE Board in Video-Key/Shadow Mode

DVE Board Indicators

The three green LEDs at the front edge of the DVE board indicate that the DVE processors are active. They all normally flash at a field rate, actually appearing continually on. A red LED lights to indicate that the DVE processor has halted. Press the pushbutton reset switch to reset the DVE board without affecting the rest of the system.

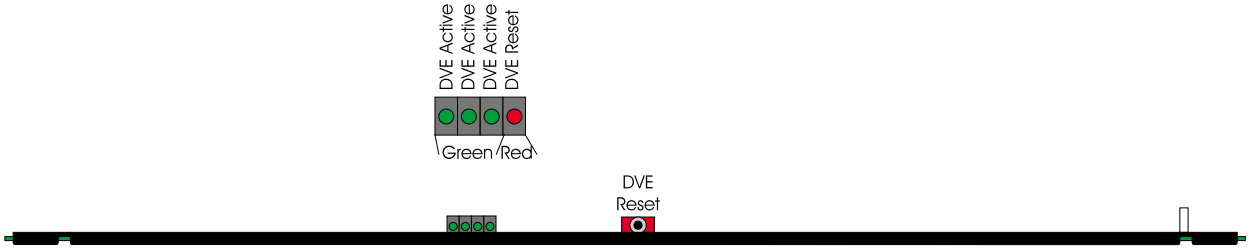


Figure 4-7 DVE Board Front Edge LEDs

DVE Board Jumpers and Modules

The DVE board has several jumpers and plug-in modules. Some modules are small printed circuit boards that install parallel to the primary board, and attach with standoffs and Phillips screws. Others are SIMMs (**S**ingle **I**n-Line **M**emory **M**odules), and plug in perpendicular to the primary board.

See the instruction sheet in the front of this manual for details on using the insertion/extraction tool for removing and installing circuit boards.

> **NOTE: Always observe proper antistatic procedures when handling circuit boards and electronic components. Failing to do so can lead to permanent damage.**

When removing and installing the plug-in modules, always place the circuit board on an antistatic flat, smooth surface. This provides support to counter the pressure used to push the modules into their sockets and prevents the board from flexing and possibly causing damage.

The Address Generator module plugs into two sockets: J8F1 (120-pin) and J4D1 (160-pin). It provides the main transform address generation, warp address generation, and the light source and texture functions.

> **NOTE: Use extra care when installing and removing the Address Generator board from the DVE board, and also carefully support the back of the DVE board to prevent it from flexing.**

There are three sockets for the DSP (Digital Signal Processor) circuitry memory SIMMs:

- SM8F1 DSP Data RAM
- SM8F2 DSP Program RAM
- SM8F3 DSP Program ROM

There are eight Filter Coefficient #1 SIMMs. They are identical, although some are used for horizontal processing and some for vertical:

- SM3E4 A channel Y horizontal filter
- SM3E2 A channel Y vertical filter
- SM3E1 A channel C horizontal filter
- SM2E3 A channel C vertical filter
- SM2E2 B channel Key/Y horizontal filter
- SM1E4 B channel Key/Y vertical filter
- SM1E3 B channel Shadow/C horizontal filter
- SM1E1 B channel Shadow/C vertical filter

There are four Delay SIMMs. They are identical, and support a video or key component path:

- SM3E3 A channel Y delay
- SM2E4 A channel C delay
- SM2E1 B channel Key/Y delay
- SM1E2 B channel Shadow/C delay

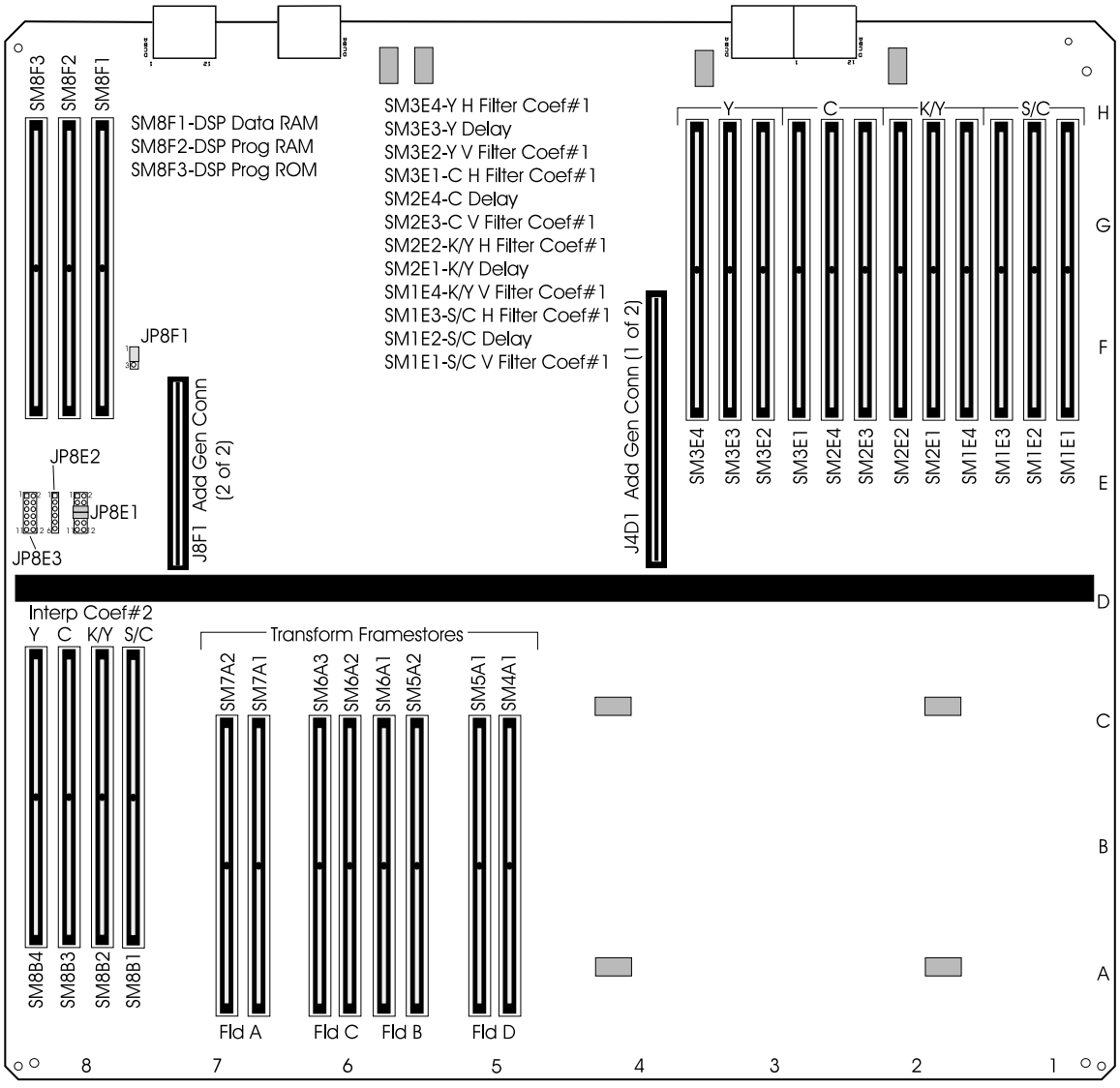


Figure 4-8 DVE Board Locations

There are four Interpolator Coefficient #2 SIMMs. They are identical, and support a video or key component path.

- SM8B4 A channel Y interpolator
- SM8B3 A channel C interpolator
- SM8B2 B channel Key/Y interpolator
- SM8B1 B channel Shadow/C interpolator

There are eight Transform Framestore SIMMs. They are identical, and are divided into four banks. Each provides a fieldstore function.

- Field A SM7A2 and SM7A1
- Field B SM6A3 and SM6A2
- Field C SM6A1 and SM5A2
- Field D SM5A1 and SM4A1

There are four jumpers on the DVE board. Their positions are factory set and should not be changed for normal operations.

- **JP8F1**
  Jumper across pins 1 and 2 for normal operation. The 2 to 3 setting is for factory use only.
- **JP8E1**
  Jumper across pins 5 to 6 and 7 to 8 for normal operation. The other settings are for factory use only.
- **JP8E2**
  Leave all positions open. This is a debug port for factory use only.
- **JP8E3**
  Leave all positions open. This is for factory use only.

Control Panel

A brief description of all Control Panel button groups and where they are located follows.

> **NOTE: There are high voltages present inside the Control Panel. Never operate the Control Panel unless the case is securely closed.**

Menu Buttons

The Menu buttons are the group of green buttons to the right of the menu display. These buttons let you access switcher functions and settings. All 8150 menus have two levels: the main (top level) menu and a set of up to six submenus. Access a top level menu by pressing its labeled button. Pressing a menu button does not change or clear any switcher settings, with the exception of the **UNDO MENU** button, which reverses the effect of the last button press.

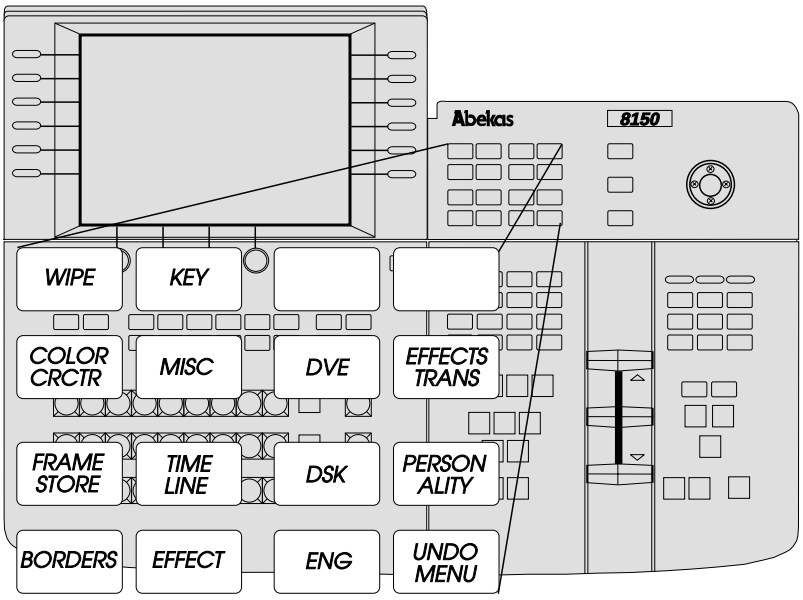


Figure 4-9 The Menu Buttons

Menu Screen Layout & Controls

Menu Display

You can adjust the menu display LCD brightness and contrast with the two thumbwheels set into the left side of the Control Panel.

Submenu Labels and Controls

A top level menu can have up to six submenu labels, shown on the right side of the menu screen. Bring up a submenu by pressing the softkey next to its label. As you press a submenu softkey, a black drop shadow appears to indicate that the submenu is active. The submenu controls (parameters and flags) appear on the left side of the menu screen. Pressing a submenu softkey does not change or clear any switcher settings.

Press a parameter/flag softkey on the left side of the menu display to select a control or toggle a flag or function. As you press a softkey, a black drop shadow appears to indicate that you have selected that control. When you press a softkey, up to four settings for that function appear at the bottom of the menu screen. You can adjust these settings with the pushknobs, or with the joystick if the arrow icon appears. The keypad buffer is always present in the lower right corner of the menu display.

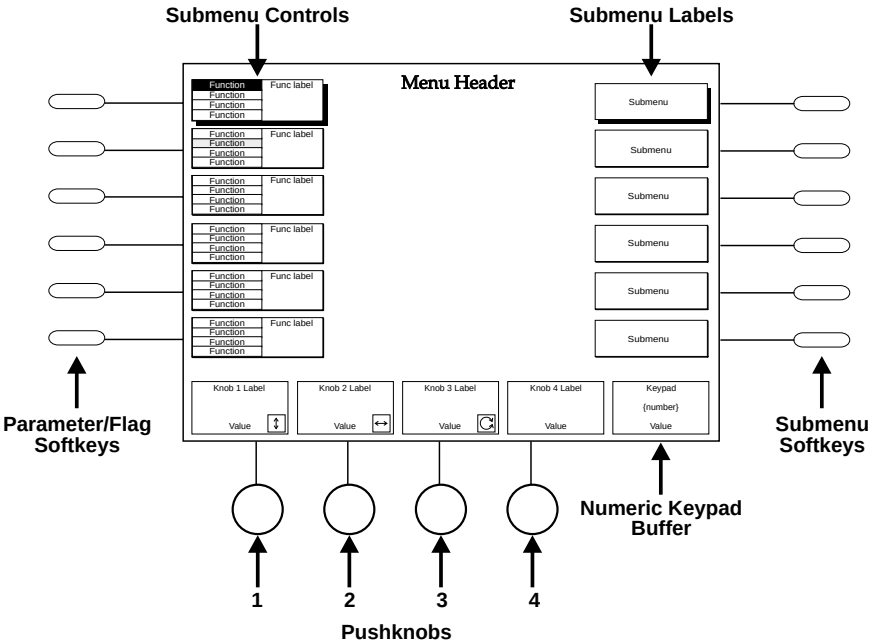


Figure 4-10 The Menu Screen & Controls

The Keypad Buffer

The keypad buffer can show one of the following:

- Empty – the keypad buffer is ready for use. You can enter a number or command from the numeric keypad, or press a pushknob to copy that pushknob value into the buffer.
- A value – pressing a pushknob enters the number in the buffer as that pushknob value.
- A value and the word "<Trim>" – pressing the **TRIM** button with a value present, or pressing **TRIM** and then entering a value, offsets the parameter value by the amount shown in the buffer (positive or negative) when you press that pushknob.
- The word "<Align>" – pressing the **ALIGN** button clears any value in the keypad buffer; pressing a pushknob that contains a numerical value changes the value to a number that is the nearest one-eighth of the full range for that adjustment. For example, if the pushknob is a gain adjustment with a range of 0.00 to 100.00, pressing **ALIGN** and the pushknob changes the value to 0.00, 12.50, 25.00, 37.50, 50.00, 62.50, 75.00, 87.50, or 100.00, whichever is closest to the current value. If the pushknob is an angular adjustment, pressing **ALIGN** and the pushknob changes the value to 0.00, 45.00, 90.00, 135.00, 180.00, 225.00, 270.00, or 315.00, whichever is closest to the current value.
- The word "<Clear>" – pressing a pushknob with the word "<Clear>" in the buffer loads the default setting for that pushknob. Pressing and holding the **CLEAR** button highlights the word "<Clear>." This lets you press several pushknobs or softkeys to set them all to their defaults.
- The word "<Negate?>" and the "**-**" symbol – press the **+/-** button by itself, then press a pushknob to change the sign of the pushknob value if its range includes negative numbers. Otherwise, it changes the value to its lowest setting.

Softkeys and Pushknobs

There are six blank buttons, called softkeys, on either side of the menu screen. The group on the right are submenu softkeys. The group on the left are parameter/flag softkeys.

You can press the submenu softkeys on the right side of the menu screen to access submenus without returning to a top level menu. Pressing a submenu softkey brings up all its parameter/flag controls on the left side of the menu. Pressing a flag softkey turns the flag on and off, or toggles through multiple settings. Pressing a parameter softkey selects that function and brings up as many as four values or settings at the bottom of the menu screen, above the pushknobs.

Entering and Modifying Parameter Values

You can change menu values or settings several ways:

- Turn the pushknob below its label.
- Enter a value in the numeric keypad, then press a pushknob to set the value. This applies to pushknobs that select sources; use the crosspoint number for a source, not its physical input number.
- Use the joystick to change pushknob settings that have arrow icons next to them. Adjust pushknob settings with left/right arrow icons by moving the joystick left and right. Adjust settings with up/down arrow icons by moving the joystick up and down. Adjust pushknob settings with circular arrow icons by twisting the joystick handle.
- You can copy a pushknob value to another pushknob. Pressing the pushknob with the needed value copies it to the keypad buffer. Pressing another pushknob enters the keypad value in it. For example, to copy the value in pushknob 1 to pushknob 2, press pushknob 1, then pushknob 2. Note the value in the numeric keypad register when copying settings this way.

Clearing and Resetting Values and UNDO MENU

You can easily reset values and entire menus to their default settings:

- Press the **CLEAR** button, then a pushknob to reset the value to default.
- Press and hold **CLEAR** and press one or more pushknobs to clear multiple settings to default.
- Press and hold **CLEAR** and press a softkey to clear all the values for that softkey to default. This resets both the softkey setting (if it is a toggle), and any pushknob values.
- Press and hold **CLEAR** and press a submenu softkey to clear all the values for that submenu to default. This resets all softkey settings (if they are toggles) and all pushknob values.
- Press and hold **CLEAR** and press a menu button to reset all the values for that menu to default. This resets all submenus, softkeys, and pushknob values.
- Press the ***MENU UNDO Key*** softkey in the Personality menu User Keys & MISC submenu to enable and disable the **UNDO MENU** button. With this button enabled (default), you can use it to "back up" through button presses. As you press **UNDO MENU**, the 8150 steps backward and "undoes" button presses and menu settings. If you disable the **UNDO MENU** button, you cannot automatically "undo" button presses.
- Press **CLEAR + UNDO MENU** to redo all the steps previously undone with **UNDO MENU**.

Program/Preset Buttons

The Program/Preset button group includes the **PGM PST**, **DSK**, and **FTB** (**F**ade-**T**o-**B**lack) buttons. They are in the lower right corner of the Control Panel.

Pressing the **PGM PST** or **DSK** button accesses control of the Program, Preset, and DSK Fill buses. When either or both of these buttons are lit, they are part of the active transition, which you can perform by pressing the **CUT** button, the **AUTO TRAN** button, or by moving the fader bar.

Pressing the **FTB** button fades the 8150 program output (including the DSK) to black. It then flashes to warn you that it has performed a fade-to-black, and that you must press the button again to fade up from black to the current program and DSK outputs.

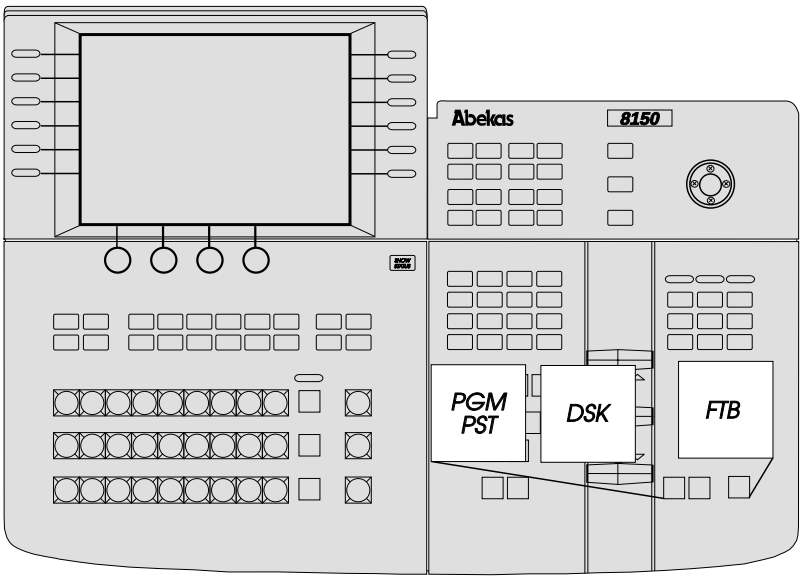


Figure 4-11 The Program/Preset Buttons

Transition Control Buttons

The Transition Control button group includes four rows of buttons. Lit LEDs in the buttons indicate the current transition settings.

The top row **BKND**, **KEY 1**, and **KEY 2** buttons select the M/E bus(es) for the active transition. Any combination of these buttons can be lit simultaneously. If **PRIORITY** is lit, the transition will exchange the priority of the two key buses. For example, if Keyer 2 is over, or has a higher priority than, Keyer 1, you can transition them so that Keyer 1 is over, or has a higher priority than, Keyer 2.

Below the bus select buttons, the **MIX**, **WIPE**, **EFFECT**, **NAM**, and **FAM** buttons select the type of transition, both for the M/E buses and the PGM/PST/DSK buses. You can, however, only select **EFFECT** as the transition type if the DVE option board is installed, and you cannot transition M/E priority as an **EFFECT**. You can press **AUTO TRANS** or move the fader bar to execute the transition. Pressing **CUT** performs the transition instantly, regardless of the transition type selected.

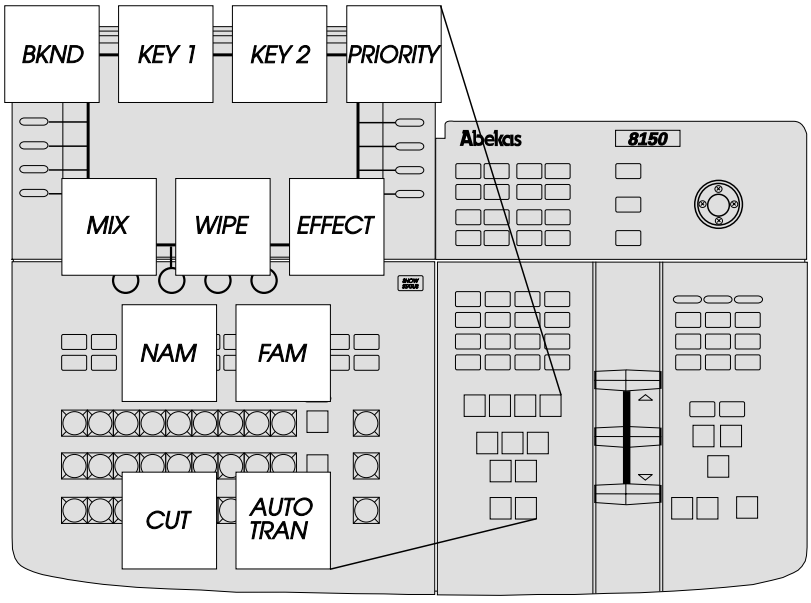


Figure 4-12 The Transition Control Buttons

Quick Keyframe Buttons

The Quick Keyframes button group includes the **INSERT NEXT**, **DELETE, MODIFY**, and **UNDO KF EDIT** buttons. All are located on the left side of the Control Panel, below the pushknobs. They only affect the current keyframe (the one that is currently highlighted in the timeline[s]), except for the **UNDO KF EDIT** button, which undoes the last effect edit. See Section 10 – Timelines in the 8150 Operations Manual for more details.

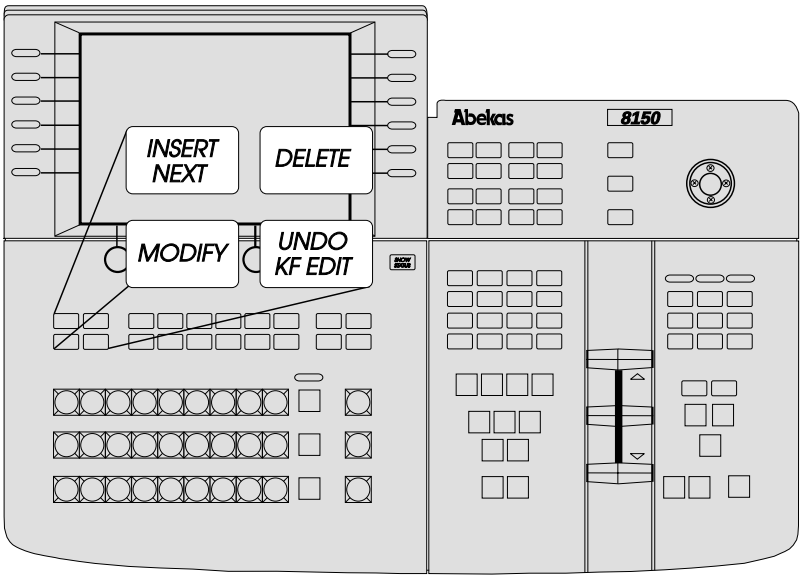


Figure 4-13 The Quick Keyframe Button Group

TimeFrame™ Effects Editor Buttons

The Timeframe Effects Editor buttons, located below the four pushknobs, include these buttons: **INSERT**, **DELETE**, **REMOVE**, **COPY**, **MODIFY**, **CLEAR KEYFRAME**, **START (REW)**, **TO**, **END (FF)**, **THIS**, **ALL**, and **ENTER**. Use these buttons to edit and modify effect keyframes. See Section 10 – Timelines in the 8150 Operations Manual for more details.

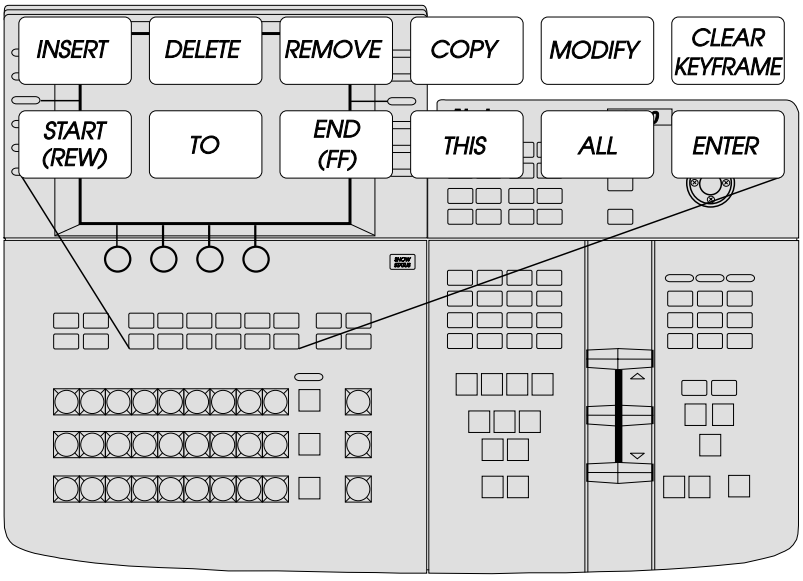


Figure 4-14 The TimeFrame Effects Editor Buttons

Delegation Buttons

The Delegation buttons are toggles. Press one or more of the **TIMELINE 1** through **TIMELINE 4** buttons to activate or deactivate Timeline editing in an effect. Double press one of the **TIMELINE** buttons, or press one of the ***TL 1*** through ***TL 4*** softkeys in the Display Timelines submenu, to delegate that Timeline as the Master Timeline. All keyframe editing commands apply only to the Timeline or group of Timelines currently selected. Lit LEDs in the **TIMELINE** buttons indicate the currently delegated Timeline(s). All four Timelines run in an effect, regardless of whether they are delegated or not.

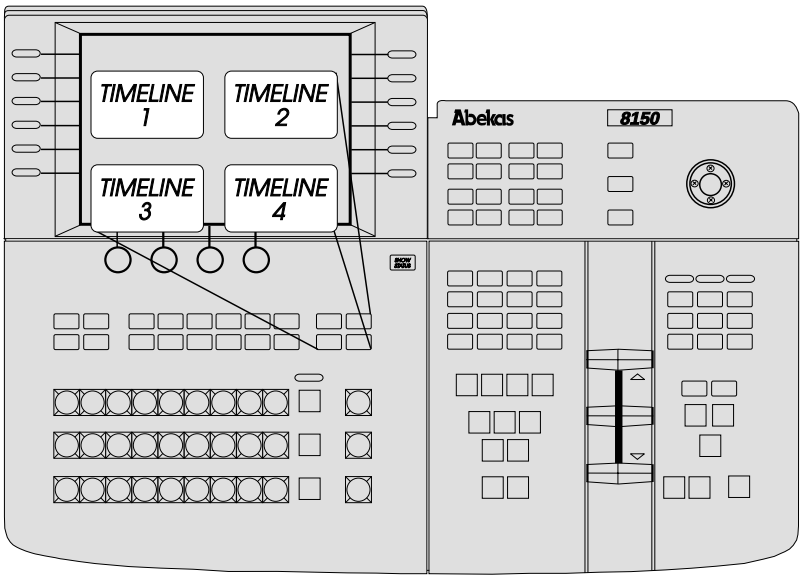


Figure 4-15 The Delegation Buttons

Timeline Buttons

The Timeline button group includes the **PREVIOUS**, **NEXT**, **STOP NEXT**, **REV**, and **RUN** buttons. All are located in the lower right corner of the Control Panel. Use these buttons to run effects and park on Timeline effect keyframes in the work buffer.

The **STOP NEXT** button lights when the Timeline effect is paused. It lights if you use the joystick in the Display Timelines submenu to manually move the Timeline cursor through the effect. It also lights if there is a pause programmed into the effect, and when you press the **STOP NEXT** button. Pressing **STOP NEXT** when it is lit turns the lamp off and takes the effect out of pause mode. This stops the effect; it runs from its beginning if you press the **RUN** button.

See Section 10 – Timelines in the 8150 Operations Manual for more details.

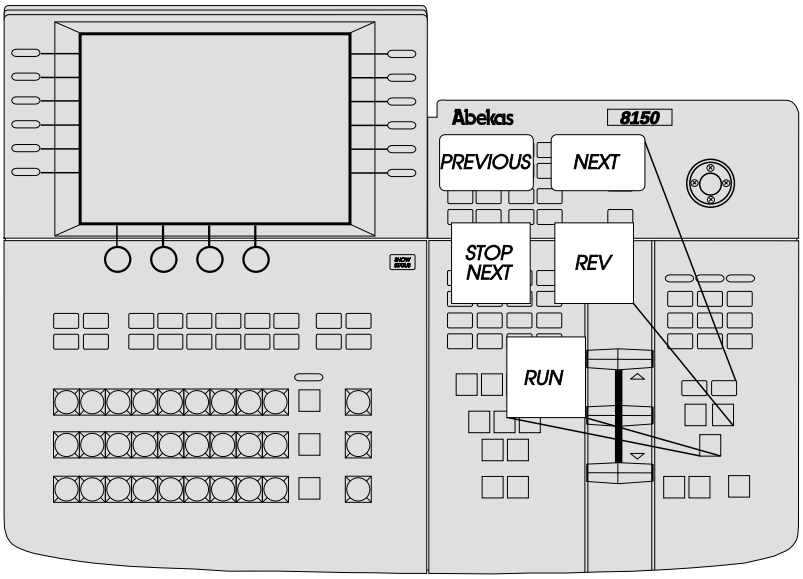


Figure 4-16 The Timeline Button Group

The Status Menu

You can see the current state of every major function in the 8150 at a glance by pressing the blue **SHOW STATUS** button below the softkeys on the right of the menu display. This menu is continually updated in real time, and shows the current state of all indicated parameters.

This menu displays status boxes that show the major system functional areas: Wipes, System, Key 1, Key 2, DSK, Aux, Framestores, Color Correctors, and Autotrans.

Wipes
This status box shows four icons: ***Primary***, ***Secondary***, ***Pgm/Pst***, and ***Matte***. The ***Primary*** icon shows the selected M/E wipe pattern (or the primary M/E pattern if the Advanced Wipe option is installed). ***Secondary*** shows the selected secondary M/E pattern, and is present only if the Advanced Wipe option is installed. ***Pgm/Pst*** indicates the selected Program/Preset wipe generator. ***Matte*** shows the pattern selected for the SuperMatte generator.

System
This box shows the status of the three RS-422 serial remote ports and the GPI port. It also shows the Signal Chassis and Control Panel software versions, plus the size of the DRAM memory: 4MB (standard) or 8MB (Extended Memory option).

Key 1, Key 2, DSK
These three boxes show the current state of each keyer, including the key type selected, the fill, key, and mask sources selected, the status of the internal and external masking functions, and the selected border type.

Aux
This box shows the sources selected for each of the four Aux bus outputs, whether these options are installed or not.

Framestores
Whether the option is installed or not, this box shows the current state of each framestore, including its input source, and whether the framestore is frozen, strobing, or in pass-through mode.

Color Correctors
Whether the option is installed or not, this box shows the current state of the seven color correctors: Background A, Background B, Keyer 1 fill, Keyer 2 fill, Program bus, Preset bus, and DSK fill. ***Unity*** indicates that the color corrector is transparent, i.e., not modified. ***YUV*** indicates that the color corrector is modified and set to YUV mode. ***RGB*** indicates that the color corrector is modified and set to RGB mode.

STEP 1: Power down the 8150 Signal Chassis. Remove the integral front cover/air filter to access the 8150 Switcher board. Use the Accom supplied tool to extract the Switcher board from the chassis and lay it on a clean, static free, grounded work surface.

NOTE: Seating the sub-board requires moderate pressure. Ensure that the Switcher board is sufficiently supported so it does not flex.

STEP 2: See Figure 3-14, on the following page, to locate the Color Corrector or Color Corrector Bypass sub-board (J5 and surrounding shaded area). Remove the screws that secure the installed sub-board to the Switcher board, then remove the sub-board.

STEP 3: Note the orientation notch in J5 and orient the replacement sub-board to match. Seat the sub-board on the connector and press gently but firmly directly over the connector area so as not to unduly flex the Switcher board. Fix the standoff fastening screws to secure the sub-board. Use the Accom-supplied tool to reseat the Switcher board in the 8150 Signal Chassis.

STEP 4: Power up the Signal Chassis. Select an appropriate video signal on the Background A and Background B buses and verify that you can mix or wipe between the two buses. Select the source on Program and Preset and verify that you can mix or wipe between the two buses.

Autotrans
This box shows the current duration values for auto transitions on the M/E bus, PGM/PST bus, and for fade-to-black (FTB) transitions.

Fortune

Press this softkey to display an inspirational message. Press **SHOW STATUS** while in this menu to clear the fortune display.

Section 5

Engineering Setup

You can set most of the 8150 engineering parameters with the Control Panel. This makes 8150 setups easier to make and recall, since there is no need for time consuming manual adjustments in the Signal Chassis.

Introduction

This section covers the three menus that control engineering and other technical setups. The Engineering menu controls the remote control port setups, video input and output parameters, and software updates. The Personality menu controls the source name and crosspoint assignment databases, as well as the function (macro) buttons, input GPI assignments, remote port enables, and preview monitor overlays (safe title, safe action, etc.). The Disk menu controls all floppy disk functions, including saving and recalling files to and from disk, deleting files, and formatting disks.

This section also includes procedures for removing and replacing major assemblies in the Signal Chassis, including the power supply, backup battery, and cooling fans. There are also disassembly instructions for the Control Panel you can use if you need to access the assemblies inside it.

Engineering Menu

Press the green **ENG** menu button to bring up the Engineering menu. The softkeys on the right side of the menu display call up submenus that adjust communications, input and output parameters, and miscellaneous settings. Use the ***Software Update*** softkey to install new system software. All software updates come with instructions.

A display in the center of the Engineering menu shows the options and features installed in your 8150, and the current version of Signal Chassis and Control Panel software.

When you save engineering (ENG) files to disk, you save all the settings in the Communications, Input, Output, and Miscellaneous submenus. When you recall an engineering file from disk, it loads all those settings into memory. See the Disk menu description later in this section for more information.

> **NOTE: When you remove an Input module from an input slot and replace it with an Input module of another type, the Engineering menu settings for the original Input module are no longer valid. If you change an input module location or type, make sure that you reconfigure the Engineering menu and save the new setup as an Engineering file. The Personality menu Input Names and Input Assignments are saved as personality files, however, and are independent of the Engineering settings.**

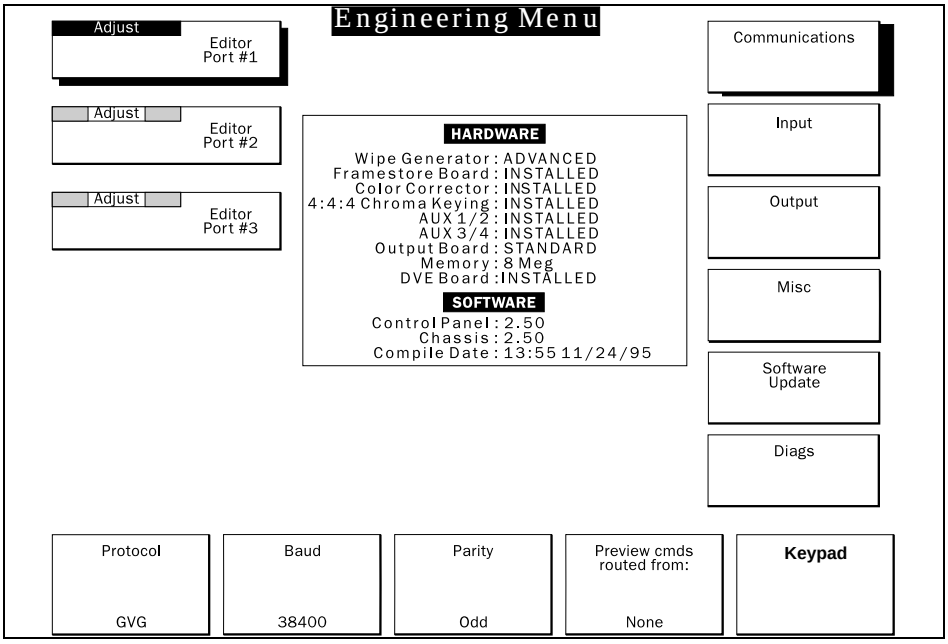


Figure 5-1 The Communications Submenu

Communications Submenu

The Communications submenu lets you set up the serial communications ports. These ports, are labeled Serial 1, Serial 2, and Serial 3 (LINC) on the back of the Signal Chassis. Each port is independent, and all can communicate simultaneously. See Section 3 – Installation for more details on these ports.

Use the **Protocol** pushknob to select a communication protocol. See the manuals that came with your editor to determine the correct protocol.

- **GVG** – The 8150 communicates with edit controllers using Grass Valley Group RS-422 protocol by emulating a GVG Model 200 video switcher. This setting also works with the Accom A82/A83 and GVG Model 1000 protocols.
- **SPARE** – Reserved for future use.
- **Sony** – The 8150 communicates with edit controllers using Sony RS-422 protocol to run timeline commands by emulating a Sony VTR.
- **SMPTE** – The 8150 communicates with edit controllers using SMPTE RS-422 protocol to run switcher and timeline commands.
- **LINC** – The 8150 controls external devices that support LINC (**L**ocally **I**ntegrated **N**ode **C**ontrol). LINC lets you frame-accurately run DVEs, DDRs, etc. as part of an 8150 Timeline effect. This setting is valid only for Serial Port 3.

Use the **Baud** pushknob to set the baud rate for the serial remote port: 1200, 2400, 9600, 38400, or 76800. See your editor's technical manual for the correct baud rate setting.

The **Parity** pushknob toggles **Odd**, **Even**, and **Off**. See your editor's technical manual for the correct parity setting.

Most edit controllers can send edit preview switch commands to the switcher, which then performs the preview switch on an Aux bus output. Since the 8150 uses the preview output as the edit preview switcher, it must re-route these preview switch commands to the preview output. In the Engineering Comms submenu, the **Preview cmds routed from:** pushknob toggles **None**, **Aux 1**, **Aux 2**, **Aux 3**, **Aux 4**, and **Aux 5**. This selects which Aux bus command is processed as a preview output command. For example, if you select **None**, it switches all Aux outputs normally and does not switch the preview output at all. If you select **Aux 4**, the 8150 routes any crosspoint switch commands intended for Aux 4 to the preview output, while continuing to switch other Aux buses normally. If you select **Aux 5**, you can set the edit controller to execute preview switching on Aux 5. Since the 8150 has no Aux 5, you can use this setting to let the editor control all four Aux outputs, plus the preview output for preview switching.

Since the GVG model 200 switcher does not support preview switching, some edit controller manufacturers do not support this function in their GVG 200 protocol. If this is the case with your editor, you should use Accom A82/A83 protocol or GVG Model 1000 protocol to control the 8150. Either of these communications protocols works with the ***GVG*** setting on the 8150, and they both support preview switching.

Input Submenu

Press the ***Input*** softkey to bring up the Input submenu. This submenu lets you select settings for bit resolution and the matte (color field) for the digital inputs, component analog input settings, and DVE inputs for effects looping.

Effects Loop Inputs

Press this softkey to access routing for the inputs from an external DVE. An Effects Loop sends processed fill and key signals from one of the keyers to an external DVE via two Aux bus outputs. Since these signals are delayed from reference, the DVE must be delayed to match by referencing it to the 8150 Aux Ref output associated with the Aux outputs in use. Upon re-entry, the 8150 anticipates this delay and changes its input re-timing window to compensate, at the same time routing the DVE video and key return signals directly to the keyer. Use the pushknobs to configure the 8150 inputs so that they can correctly compensate for the delayed DVE outputs.

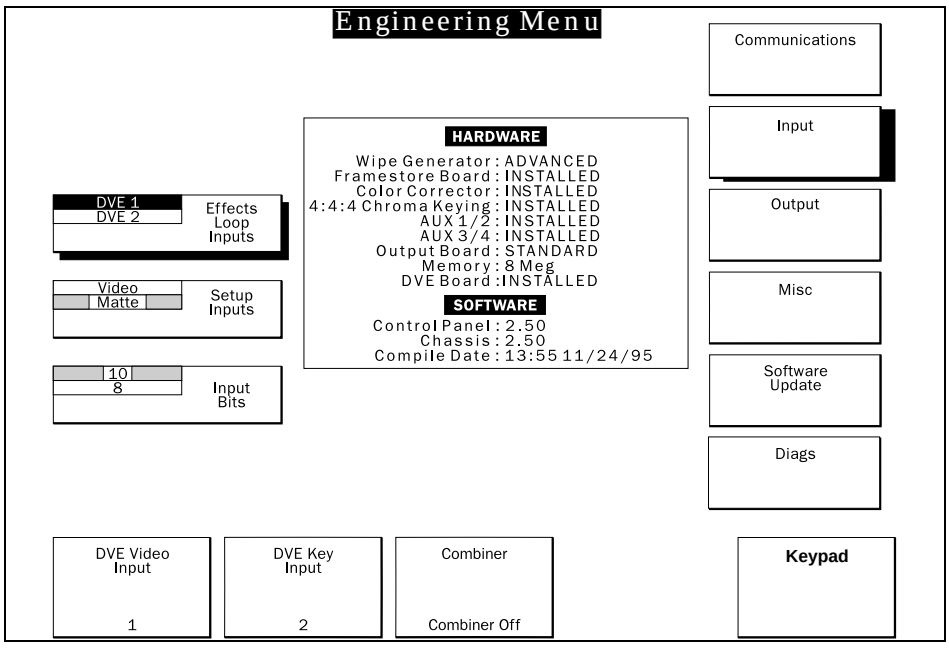


Figure 5-2 The Input Submenu - Effects Loop Inputs

If the internal DVE board is not installed, you can have up to two external DVEs connected to the 8150 for effects looping purposes, although you can perform only one Effects Loop at a time. For routing purposes, a DVE connected to Aux 1 and 2 is called DVE 1, and a DVE connected to Aux 3 and 4 is called DVE 2.

If the internal DVE board is installed, the Aux 1 and 2 outputs are still available for effects looping, while the Aux 3 and 4 output may be used for effects looping if the internal DVE does not require its texture inputs to be retimed. See the description of the Engineering menu Miscellaneous submenu later in this section for more information on Aux 3/4 output timing and DVE texture input timing interaction.

For effects looping to work correctly, the Aux 1 output must be connected to the Video input of DVE 1, and the Aux 2 output must be connected to the Key input of DVE 1. If you are using a second DVE, or are using a single DVE with Aux 3 and 4, the Aux 3 output must be connected to the Video input of DVE 2, and the Aux 4 output must be connected to the Key input of DVE 2. Toggle the ***Effects Loop Inputs*** softkey to select ***DVE 1*** or ***DVE 2***. Note that connections other than these will not produce the desired result.

If you are using two external DVEs, you may also be using a combiner to composite the DVEs together before re-entering them into the 8150 as a single video and key source. In this case, the DVEs typically must be zero timed to each other. This may not be the case, however, when one DVE is locked to the 8150 main Aux Ref output and the other is locked to the Aux Ref 2 output. The **Combiner** pushknob lets you force all four Aux outputs to the timing of the Aux output with the largest delay. This zero times all Aux outputs and their related Aux Ref outputs with each other.

> **NOTE: If you are using the video and key outputs of a combiner, you must select its video and key outputs as either the** *DVE 1* **or** *DVE 2* **video and key inputs, but not both; the other DVE input settings should remain at 0 for both video and key.**

Use the **DVE Video Input** pushknob to select the 8150 input to which the selected DVE video output is connected. This allows it to be retimed properly when using it in an Effects Loop.

Use the **DVE Key Input** pushknob to select the 8150 input to which the selected DVE key output is connected. This allows it to be retimed properly when using it in an Effects Loop.

Use the **Combiner** pushknob to select relative Aux output timing. **Combiner Off** is the default state, which lets the Aux 1 and 2 outputs

have a different delay than the Aux 3 and 4 outputs. **Combiner On** forces all four Aux outputs, and therefore both Aux Ref outputs, to the timing of the Aux outputs used in a DVE Effects Loop. See the discussion later in this section for a step-by-step description of setting up an Effects Loop.

> **NOTE: Combiner On mode only works correctly if the output delay of Aux 1 and 2 is set to Auto (see the Output submenu discussion later in this section). If the Aux 1 and 2 output delay is set to 1 Frame when Combiner On mode is active, there may be timing errors on the Aux 3 and 4 outputs because they cannot be delayed by one frame.**

Setup Inputs

The Serial Digital and Parallel Digital Input modules each include matte (color field) generators so that you can create extra color mattes and use them as border fills or key fills. The component analog inputs do not have built-in matte generators, and this softkey does not appear when you select an input at which a Component Analog module is installed. The **Input Number** pushknob scrolls through the 16 inputs.

With ***Video*** selected for the input, the active video input is passed to the system. Toggling the softkey selects the ***Matte*** color field, which makes the matte generator the source for that input. The matte generators are limited to RGB-legal colors.

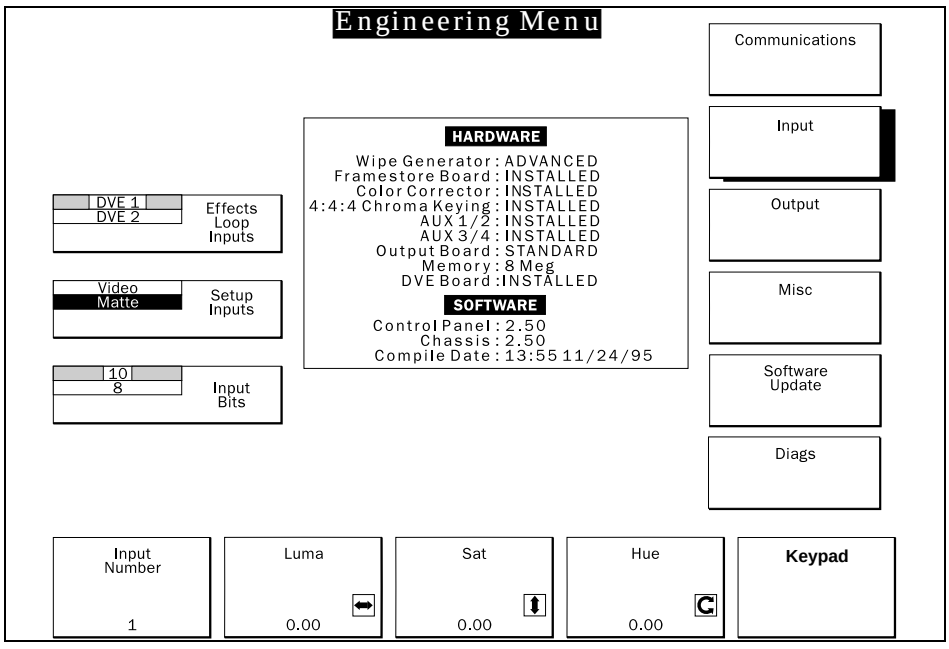


Figure 5-3 The Input Submenu - Input Matte Generator

The **Luma** pushknob sets a luminance value, in the range 0 percent (black) to 100 percent.

The **Sat** pushknob sets the chroma saturation value in the range 0 percent (monochrome) to 100 percent.

The **Hue** pushknob adjustment ranges from +/- 720 degrees.

Input Bits

Set the bit resolution of the selected input with the ***Input Bits*** softkey. Normally, leave it at 10 bits (the default), unless the source connected to this input has only 8-bit resolution and does not set the LSBs (least significant bits) to 0, as may be the case with some older parallel digital equipment. This softkey does not appear for inputs that have an Analog Input module (either Component or Composite) installed.

Analog Input Setups

> **NOTE: This softkey appears only when you have selected an input of a Dual Component Analog Input module, or the video input of a Component Video + Key Input module.**

If a Component Analog Input module is installed at the selected input, ***Analog Input Setups***, ***Gain/Pedstl Offsets,*** and ***H Phase Offsets*** softkeys replace the ***Setup Inputs*** and ***Input Bits*** softkeys. The ***Analog Input Setups*** softkey accesses pushknobs as described below.

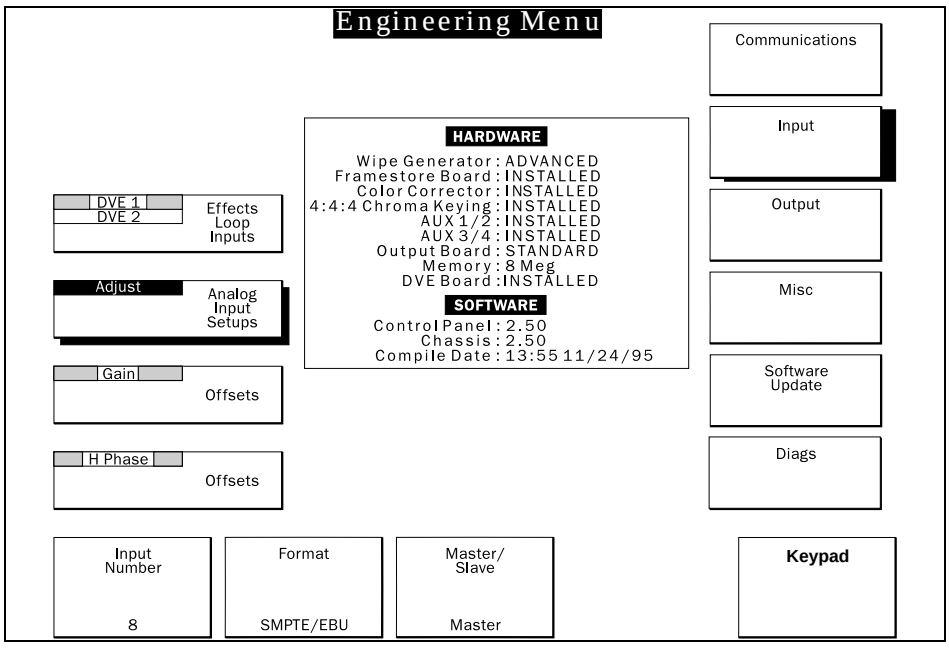


Figure 5-4 The Input Submenu - Analog Input Setups

Use the **Input Number** pushknob to select the physical input number. This number corresponds with the input number on the Signal Chassis, not the crosspoint button assignment. Even numbered inputs have a **Master/Slave** pushknob that the odd numbered inputs do not have, as described later.

The **Format** pushknob sets the analog signal type for the selected input with the **Input Number** pushknob. All of the selections listed below appear for either input of the Dual Component Analog Input module; however, only the video selections appear for the video (odd numbered) input of the Component Video + Key Input module, while only the key selections appear for the key (even numbered) input of that module.

- **SMPTE/EBU** – The SMPTE/EBU N10 700mV color difference standard, containing Y, R-Y, and B-Y components with black level at 0mV. This format is compatible with all 625-line standard and MII® VTRs and some 625-line Betacam® and Betacam®SP VTRs that have been modified for EBU levels.
- **50Hz Beta** – Y/R-Y/B-Y color difference signals from 625-line Betacam® or Betacam® SP VTRs.
- **60Hz Beta wSU** – NTSC-related Y/R-Y/B-Y with 7.5 IRE (54mV) black level (i.e., with setup). This format is compatible with all 525-line Betacam® and Betacam® SP VTRs outside of Japan.
- **60Hz Beta woSU** – NTSC-related Y/R-Y/B-Y with 0 IRE (0mV) black level (i.e., without setup). This format is compatible only with Japan-market 525-line Betacam® and Betacam® SP VTRs.
- **60Hz MII** – Y/R-Y/B-Y with 7.5 IRE (53mV) black level. This format is used on 525-line standard MII® VTRs. 625-line MII® format VTRs use the SMPTE/EBU format.
- **SMPTE/EBU GBR** – The SMPTE/EBU 700mV standard containing red, green, and blue components with no setup (0mV black level).
- **SMPTE/EBU KEY** – A black and white (high contrast) signal used as a dedicated key source at SMPTE/EBU levels (peak white = 700mV). This format internally copies the luminance value to the Cb and Cr channels to provide a key signal for the chrominance samples of the fill signal. Use this setting if the input is a dedicated monochrome key signal with no chroma.
- **NTSC KEY wSU** – A black and white (high contrast) signal with 7.5 IRE (54mV) black level (i.e., with setup), used as a dedicated key source at NTSC levels (peak white = 100 IRE or 714mV). This format internally copies the luminance value to the Cb and Cr channels to provide a key signal for the chrominance samples of the fill signal. Use this setting if the input is a dedicated monochrome key signal with setup and no chroma.

The Component Analog + Key Input module also contains a mode that converts high resolution analog RGB or Y/R-Y/B-Y to a component

digital signal at the 4:4:4 sample rate for use as a chroma key source with the optional 4:4:4 chroma keyers. This feature is automatically enabled only when both of the following conditions are met:

- At least one keyer is set as a Chroma Key in the Main submenu with Chroma 444 selected as its Key Type in the Advanced Chroma Key submenu.
- That keyer has the odd numbered "A" input of the Component Analog + Key module selected as its 444 Cut Source #1. (You should also select the even numbered "B" input of the same module as the 444 Cut Source #2 for this feature to operate correctly; this selection is not automatic.)

With both of these conditions met, the input module changes its sampling mode from 4:2:2 to 4:4:4 and uses the normal key path for the extra chrominance samples. This means that, in 4:4:4 mode, a key signal connected to the key input cannot be routed to the 8150. However, changing either of the above conditions (selecting a different mode for the keyer, or selecting a different 4:4:4 Cut Source #1) sets the sampling rate of the input module back to 4:2:2 and allows the use of the key input.

The **Master/Slave** pushknob appears only for even numbered inputs for which a Component Analog Input module is installed. This feature lets analog signals without sync be connected to the even numbered "B" input (2, 4, 6, etc.), and a companion signal with sync, such as correlated key or composite sync, to be connected to the adjacent odd numbered "A" input (1, 3, 5, etc.) on the same module. The default setting for this control is **Master**; you should set it to **Slave** only if the signal connected to the "B" input has no sync on the G or Y channel (including non composite key signals). The "A" input must have sync on the G or Y channel.

The Component Video + Key module contains a separate sync input that you can use to supply separate sync without using up a dedicated video input. The use of this separate sync input is selected with jumpers on the circuit board of the module. See Section 3 – Option Installation for information on jumper settings for this module.

Gain/Pedstl Offsets

This softkey accesses **Y Gain**, **U Gain**, and **V Gain** pushknobs (plus a **Pedestal** pushknob if the selected format contains setup). Each pushknob setting defaults to 0.00, which is set at the factory for unity gain. A negative offset reduces the gain (or pedestal) and a positive offset increases the gain (or pedestal) of each channel individually. There are no red/green/blue gain adjustments when the input format is RGB, as the gain adjustments are downstream of the RGB to YUV transcoding matrices.

> **NOTE: These pushknob adjustments should not replace output level adjustments at the source. They are intended only to compensate for minor non-unity gains in a video system.**

H Phase Offsets

This softkey accesses the **H Phase** pushknob, which lets you make minor corrections to the horizontal picture position. The default is 0.00, set at the factory for no horizontal shift. A negative offset shifts the active picture to the left, and a positive offset shifts the active picture to the right.

> **NOTE: Do not use this pushknob as a substitute for system timing adjustments at the source. It is intended only to compensate for minor timing errors in a video system.**

Composite Input Setups

> **NOTE: This softkey appears only when you have selected the video input of a Composite Video + Key Input module.**

If a Composite Video + Key Input module is installed at the selected input, ***Composite Input Setups, Gain/Pedstl Offsets,*** and ***H Phase Offsets*** softkeys replace the ***Setup Inputs*** and ***Input Bits*** softkeys. The ***Composite Input Setups*** softkey accesses pushknobs as described below.

Use the **Input Number** pushknob to select the physical input number. This number corresponds with the input number on the Signal Chassis, not the crosspoint button assignment. Odd numbered inputs on this module are dedicated video inputs, while even numbered inputs are dedicated key (i.e., monochrome or luminance only) inputs.

> **NOTE: Composite video inputs must contain color burst in order for the decoder to lock to the input correctly. The video input does not support signals without color burst. The Key input, however, can process monochrome signals with or without color burst.**

The **Adaption** pushknob selects the mode for decoding the composite analog signal into component digital video.

- **Adapt Vid –** This is the default setting. It is an adaptive combination of Notch and Comb modes (see below) that has a high noise threshold. Use this setting for video that comes from cameras, analog VTRs, or other sources that maybe noisy. In NTSC systems, the effect of this

setting appears identical to the Adapt Gph mode; in PAL systems, there is a noticeable difference between the two.

- **Adapt Gph –** This is an adaptive combination of Notch and Comb modes (see below) that has a low noise threshold. Use this for video that comes from computer graphics, character generators, or other digital sources that are noise free. In NTSC systems, the effect of this setting appears identical to the Adapt Gph mode; in PAL systems, there is a noticeable difference between the two.
- **Notch –** This is a simple bandpass filter that reduces or eliminates cross-color effects (dot crawl) on horizontal edges in the image. However, vertical edges and luminance frequencies close to that of color subcarrier produce color fringing. This setting is most useful with images that have no vertical edges (i.e. horizontal detail).
- **Comb –** This is a comb filter that reduces or eliminates color fringing on vertical edges and luminance frequencies close to that of color subcarrier in the image. However, horizontal edges in the image produce cross-color effects (dot crawl). This setting is most useful with images that have no horizontal edges (i.e. vertical detail).

Use the **Hue** pushknob to adjust the chroma phase of the input composite video; this control has a range of +/– 180 degrees of subcarrier. Use the **Sat** pushknob to adjust the chroma level of the input composite video; this control has a range of –50 to +150 percent of nominal saturation.

Proc Adjust (Gain/Pedstl)

Press this softkey to access controls for adjusting levels for the decoded components of the composite video.

Use **Y Gain** to adjust the level of the luminance component; use **U Gain** to adjust the level of the B-Y component; and use **V Gain** to adjust the level of the R-Y component. The range of all three is –50 to +150 percent of nominal. Use **Pedestal** to adjust the black offset of the Y component. The default setting of 0.00 assumes that the black level of the incoming composite video is correct for the current line standard (7.5 IRE or 54mV in NTSC, or 0mV in PAL). For NTSC signals without 7.5 IRE setup, such as in Japan, the default setting is incorrect and should be adjusted for proper black level. The range of this control is +/– 10 percent.

> **NOTE: These pushknob adjustments should not replace output level adjustments at the source. They are intended only to compensate for minor non-unity gains in a video system.**

More Proc Adjust (H Phase/Ofs)

Press this softkey to access controls for adjusting the horizontal position of the active picture, as well as adjusting the DC offsets of the chrominance components of the decoded input video.

Use **H Phase** to adjust the horizontal position of the active picture relative to sync. This control has a range of +/– 1000 nanoseconds (+/– 1 microsecond).

Use **U Offset** and **V Offset** to adjust the DC offsets of the decoded B-Y and R-Y components respectively. The range of these controls is +/– 50 percent.

> **NOTE: Do not use this pushknob as a substitute for system timing adjustments at the source. It is intended only to compensate for minor timing errors in a video system.**

Key Input Setups

> **NOTE: This softkey appears only when you have selected the key input of a Composite Video + Key Input module.**

If a Composite Video + Key Input module is installed at the selected input, ***Key Input Setups***, ***Gain/Pedstl Offsets***, and ***H Phase Offsets*** softkeys replace the ***Setup Inputs*** and ***Input Bits*** softkeys. The ***Key Input Setups*** softkey accesses pushknobs as described below.

Use the **Input Number** pushknob to select the physical input number. This number corresponds with the input number on the Signal Chassis, not the crosspoint button assignment. Odd numbered inputs on this module are dedicated video inputs, while even numbered inputs are dedicated key (i.e., monochrome or luminance only) inputs.

Use the **Mode** pushknob to select the format of the input key signal. If the key signal contains sync and color burst, use the **Comp** setting, which locks to the burst signal. If the key signal contains sync but no color burst, use the **NComp** setting, which locks to horizontal sync. If the key signal has no sync, use the **Slave** setting, which uses sync from the video input to lock the key input.

> **NOTE: If the key input has no sync, make sure that it is zero timed (+/– one microsecond) to its companion video input. A timing discrepancy greater than this does not allow the key input to be properly timed to the video input.**

Proc Adjust (Gain/Pedstl)

Press this softkey to access controls for adjusting levels for the analog key input.

Use **Key Gain** to adjust the level of the key input. The range is –50 to +150 percent of nominal. Use **Pedestal** to adjust the black offset of the key input. The default setting of 0.00 assumes that the black level of the incoming composite video is 0mV or 0IRE for either line standard. The range of this control is +/– 10 percent.

More Proc Adjust (H Phase/Ofs)

Press this softkey to access the **H Phase** pushknob, which adjusts the horizontal position of the active key signal relative to sync. This control has a range of +/– 1000 nanoseconds (+/– 1 microsecond).

Output Submenu

This submenu has adjustments for the 8150 serial digital outputs. The menu display varies depending on the Output module installed, as covered in the following discussion.

Output Delay

This softkey appears only if the Enhanced (Frame Delay) Output module is installed (some 8100s and all 8150s). Press ***Output Delay*** to bring up the **Program**, **Preview**, and **Aux 1/2** pushknobs. Their default delay settings are **34 Lines** for the program and preview outputs, and **Auto** for the Aux 1 and 2 outputs. Use these settings when a one frame delay through the 8150 is not acceptable or appropriate, as when using preread, or when using all four Aux outputs with the Combiner On setting active. The **1 Frame** setting provides a one frame delay (from reference) for the selected output, allowing it to be re-entered and retimed into your video system.

An output delay control for Aux 3 and 4 does not appear, even if the option is installed, because these outputs are not capable of one frame delays. Their outputs are fixed in "Auto" mode and cannot be changed.

> **NOTE: The Program 2 output is always delayed by one frame and cannot be changed. If you are using preread, set the Program 1 output to 34 Lines and feed it to the preread VTR.**

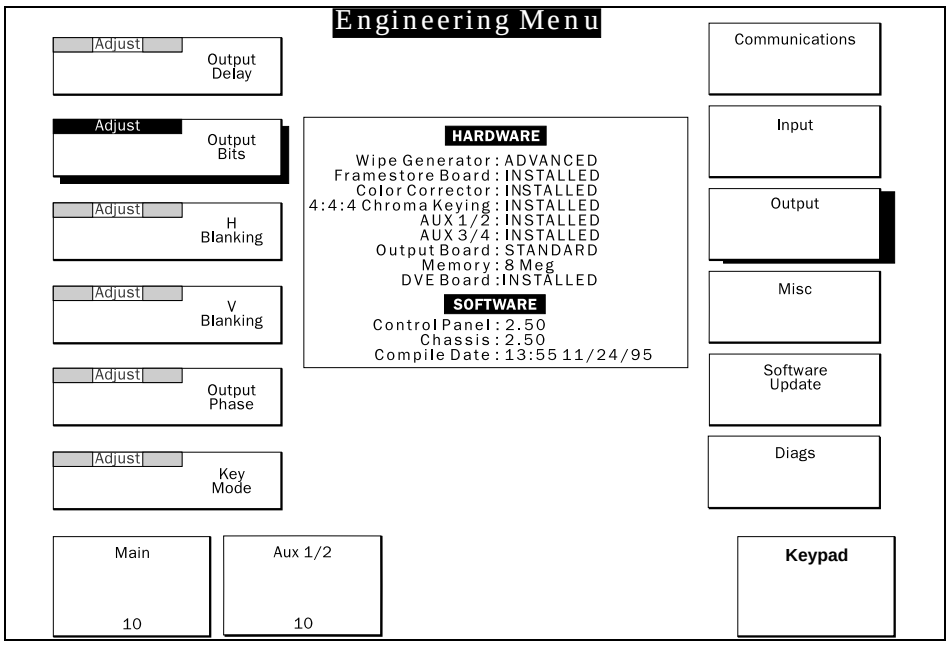


Figure 5-5 The Output Submenu

Output Bits

Press this softkey to set the bit resolution for the serial digital outputs. If the original Output module is installed (8100s only), there is one control for the combined **Main** outputs (Program 1, Program 2, Preview, Aux 1, and Aux 2) and a separate control for the **Aux 3/4** output pair, if present. If the Enhanced (Frame Delay) Output module is installed (some 8100s and all 8150s), there is a control for the **PGM/PVW** outputs and separate controls for the **Aux 1/2** output pair and **Aux 3/4** output pair, if installed. Use the **10** setting for full 10-bit resolution; this is the default. **8 Rounded** rounds the 10-bit signal's two least significant bits (LSBs) up or down to the nearest true 8-bit level. Use this setting if the output feeds an 8-bit device; the rounding reduces banding in shallow ramps and color washes. The **8 Truncated** setting discards the two LSBs of the 10-bit signal; use this mode for troubleshooting only.

H Blanking

This softkey appears only with the Enhanced (Frame Delay) Output module installed (some 8100s and all 8150s). Press ***H Blanking*** to adjust the horizontal blanking width of the main outputs (Program 1/2, Preview, and Aux 1/2) and the Aux 3/4 output pair. If ***H Blanking*** is ***OFF***, the full digital active line is output. However, the risetimes of the blanking-to-active video transitions are unfiltered and may be subject to ringing. Typically, you may wish to leave ***H Blanking ON*** to properly filter these transitions.

The pushknobs are as follows:

- **Main Left –** Adjusts the blanking width of the left edge (blanking back porch) of the main outputs, described above, in 2 pixel (148 nsecond) steps. The range is about 600 nseconds. The default, **1**, sets minimum blanking; **4** sets maximum blanking.
- **Main Right –** Adjusts the blanking width of the right edge (blanking front porch) of the main outputs, described above, in 2 pixel (148 nsecond) steps. The range is about 600 nseconds. The default, **1**, sets minimum blanking; **4** sets maximum blanking.
- **Aux 3/4 Left** – Appears only if the Aux 3/4 option is installed. Adjusts the blanking width of the left edge (blanking back porch) of the Aux 3 and 4 outputs in 2 pixel (148 nsecond) steps. The range is about 600 nseconds. The default, **1**, sets minimum blanking; **4** sets maximum blanking.
- **Aux 3/4 Right** – Appears only if the Aux 3/4 option is installed. Adjusts the blanking width of the right edge (blanking front porch) of the Aux 3 and 4 outputs in 2 pixel (148 nsecond) steps. The range is about 600 nseconds. The default, **1**, sets minimum blanking; **4** sets maximum blanking.

V Blanking

This softkey appears only if the Enhanced (Frame Delay) Output module is installed (some 8100s and all 8150s). Press ***V Blanking*** to set the vertical blanking width of the Program 1 and 2, Preview, and Aux 1 and 2 outputs. DIP switches set the vertical blanking widths for the original Output module (8100s only) and the Aux 3/4 outputs (all 8100s/8150s with this option).

As of this writing, the 8150 ships with lines 12 through 19 blanked, and line 20 is the first active line in 525-line systems. In 626-line systems, lines 15 through 22 are blanked, and line 23 is the first active line. In both cases, the status of the field 2 line that corresponds to the indicated Field 1 line is identical to the Field 1 line status.

The **Blanking Status** pushknob label shows which lines are blanked by displaying the line number with its two digits oriented vertically. In 525 systems, the display looks like this:

11111111--
23456789--

In 626 systems, the display looks like this:

11111222--
56789012--

The dashes (**--**) are "place holders" for the lines that would appear next in the sequence, and indicate that those lines are not blanked.

To change the vertical blanking status of any line pair, use the **Select Line** pushknob to select the Field 1 line number whose blanking status you want to change, then press the ***V Blanking*** softkey. This toggles the display to add that line if it was not there before, or to remove it if it was. The corresponding line in field 2 is blanked or unblanked accordingly.

Output Phase

Press this softkey to adjust the horizontal output timing of all 8150 outputs, both digital and analog. The **Horizontal Phase** pushknob sets system output horizontal timing. The default value is 8. The range is -256 to 245 (approximately 9.28 microseconds) in 1/4 pixel (18.5 nanosecond) increments.

> **NOTE: The original Output module (8100s only) has a fixed vertical delay of 34 lines for the program and preview outputs, which you cannot adjust; the Horizontal Phase control is for horizontal timing only. If the Enhanced (Frame Delay) Output module is installed (some 8100s and**

all 8150s), some outputs may have no vertical delay, but the Horizontal Phase control still affects all outputs.

Key Mode

Press this softkey to select the type of signal for the Preview, Aux 2, and Aux 4 outputs. Because of the way that the 8150's M/E and DSK processors perform key compositing, the gain and offset of all key signals are changed internally. This rescaled key signal is also copied to the chrominance samples of the key path, so that the chrominance samples of the fill signal and background video are keyed correctly. This Key Mode control removes the chrominance key samples and rescales the gain and offset of the key signal so that it is correct for external viewing or use.

> **NOTE: The analog monitor output of the original Output module (8100s only) is not affected by this control.**

The settings are as follows:

- **Auto** – Automatically selects one of the following settings according to whether the source routed to that output is a video signal or a key/mask/wipe signal.
- **Video** – Passes the selected source without modification.
- **Key w/o Border** – Removes the chrominance from the signal and rescales the luminance for use as an external key signal, minus any border that the 8150 has applied to it.
- **Key w/ Border** – Removes the chrominance from the signal and rescales the luminance for use as an external key signal, including any border that the 8150 has applied to it.

Miscellaneous Submenu

Press this softkey to bring up the Miscellaneous submenu, which lets you select the line standards, aspect ratio, lamp saver delay, and Aux output usage if the DVE board is installed.

Video Standard

Toggle this softkey to select the 525-line or 625-line standard for the system.

> **NOTE: The 8150 requires a black burst or composite sync reference signal at the selected line standard to operate properly.**

Aspect Ratio

Toggle this softkey to select 4:3 or 16:9 aspect ratio processing for the system. ***4:3*** is the default; ***16:9*** changes aspect ratio calculations only and should be used when working with video intended to have a 16:9 aspect ratio.

> **NOTE: The 8150 processes only component digital video with luma and chroma sampled at 13.5MHz and 6.75MHz respectively. Some 16:9 component digital video formats have luma and chroma sampled at 18MHz and 9MHz respectively. The 8150 can neither input nor output digital video sampled at this rate; the 16:9 selection changes aspect ratio calculations only.**

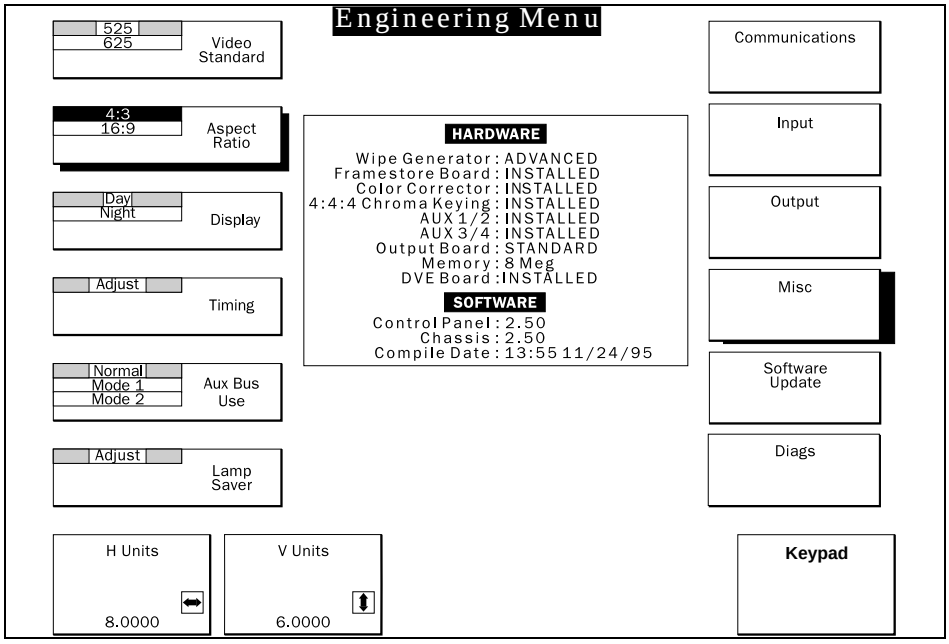


Figure 5-6 The Miscellaneous Submenu

Display

This softkey toggles ***Day*** and ***Night***. Day mode displays the menus in dark text over a light background for legibility in bright environments. Night mode displays the menus in light text over a dark background for reduced glare in dark environments. Set this according to your preference.

Timing

Press this softkey to access the **Edit Const**, **Field Motion**, and **Field Ref** pushknobs. The editor constant is a two digit number that specifies two different parameters for use with edit controllers. Field motion determines at what rate a transition or Timeline effect is updated as it runs. Field reference determines on which field a cut occurs or transition begins.

Edit Const

Since the 8150 can emulate both SMPTE and Sony protocol VTRs, you may need to adjust the timing relationship between the edit controller commands and the 8150's execution of the commands. The 8150 supports two edit timing parameters, know as Command Delay and Time Code Delay, although these names do not appear in the menu. These two parameters affect the 8150 only when you use it to run Timeline effects from an edit controller by emulating a VTR.

Command Delay is the delay (in fields) between the time that the 8150 receives a command and the time that it actually executes it; the higher the Command Delay number, the longer it waits to execute the command.

Time Code Delay actually delays the time code that the 8150 sends to the edit controller. By delaying the time code to the edit controller, the 8150 appears to be "behind" where the edit controller expects it to be, forcing the edit controller to advance the 8150 Timeline effect relative to other devices in the system.

The **Edit Const** value can be a number up to four digits, but only the last two are significant. The last digit specifies the Command Delay parameter: it is a single digit, in the range 0 to 9. This gives a maximum of nine fields, or four and one half frames, of delay. Enter a Command Delay value if the 8150 executes editor commands too soon relative to other devices in the system.

The second-to-last digit specifies the Time Code Delay parameter: it is a single digit in the range 0 to 9. This gives a maximum of nine fields, or four and one half frames, of delay. Enter a Time Code Delay value if the

8150 is consistently "behind" or "late" relative to other devices in the system.

This is a "trial and error" adjustment, but once set, you should not need to change it for a given edit controller. Type the Time Code Offset value first, then the Command Delay value, then press the **Edit Const** pushknob to enter them. If the Time Code Offset value is 0, it does not appear in the display after you enter it.

Field Motion

When the 8150 executes a transition or runs a Timeline effect, it calculates a new mix coefficient every field, referred to as an update. There may be occasions, however, when you want to update a transition or Timeline effect only once per frame, or, in 525-line systems, you may want to update a transition or Timeline effect at the 3:2 field sequence of a film-to-video transfer. The Field Motion control allows you to specify how often, and on which field boundary, transitions and Timeline effects are updated.

- **Normal** – Updates transitions and Timeline effects at every field boundary, i.e., once per field, for maximum smoothness. This is the default setting.
- **F1** – Updates transitions and Timeline effects at every Field 1 boundary, i.e., once per frame.
- **F2** – Updates transitions and Timeline effects at every Field 2 boundary, i.e., once per frame.
- **3:2/A, 3:2/B, etc.** – Updates transitions and Timeline effects in a staggered fashion (twice per five field sequence) to match 525-line film-to-video transfers. The first update occurs after three fields, the next update occurs two fields later, the next occurs three fields later, etc. There are five selections because the sequence can potentially start on any of the five fields in the sequence; you must use trial and error to determine which of the five is correct. This mode is useful only in 525-line systems.

Field Ref

Normally, the 8150 executes a cut or other transition on the next field after it receives the command, which could be Field 1 or Field 2. There may be times when you want the transition to begin only on Field 1, or only on Field 2.

> **NOTE: These field dominance settings affect transitions performed by pressing a source crosspoint directly, or by pressing CUT, AUTO TRAN, FTB, or by moving the fader bar. Timeline effects always start and stop running at the boundary between the end of Field 2 and the beginning of Field 1, i.e., they always have Field 1 dominance.**

Use the **Field Ref** pushknob to select the field on which the transitions are executed:

- **Either** – Executes a cut or begins a transition at the boundary between the current field and the next, whether it is Field 1 or Field 2. This is the default setting.
- **F1** – Executes a cut or begins a transition only at the boundary between the end of Field 2 and the beginning of Field 1.
- **F2** – Executes a cut or begins a transition only at the boundary between the end of Field 1 and the beginning of Field 2.

Aux/Txt Retime

This softkey appears only when the optional internal DVE is installed in the 8150.

You can use any 8150 source except DSK Preview as a video input to either channel of the DVE, and the DVE retimes itself for that source. You can also use any direct source (defined below) in the 8150 as a texture input to either channel of the DVE. However, because there may be a timing difference between the DVE video input and the DVE texture input, the 8150 must compensate for this difference. Because there are not dedicated delay paths for the DVE texture inputs, the 8150 must "borrow" the Aux 3 and/or Aux 4 retiming paths in the event that the selected DVE video and texture inputs are not zero timed to each other.

The ***Aux/Txt Retime*** control allows you to select the following modes:

- ***Aux 3/Aux 4*** – All Aux 3 and 4 sources are correctly timed, but DVE Channel A and Channel B texture sources may not be. Select this mode if you need to use the Aux 3 and 4 outputs or are not using the DVE texture inputs.
- ***Aux 3/Txt A*** – All Aux 3 sources and DVE Channel A texture sources are correctly timed, but Aux 4 and DVE Channel B texture sources may not be. Select this mode if you are using only the DVE Channel A texture input, such as in V+K or VK+S modes, and need to use the Aux 3 output only.
- ***Txt A/Txt B*** – All DVE Channel A and Channel B texture sources are correctly timed, but Aux 3 and 4 may not be. Use this mode if you are using both DVE texture inputs in V+V mode or do not need the Aux 3 and 4 outputs.

Each of the three modes is explained in the table on the following page. Note that the DVE video input selections affect the functionality of these modes. Even though any source in the 8150 (except DSK Preview) is valid as a DVE video input, only a direct source is valid as a DVE texture input. A "direct source" is defined as a source in the 8150 that is not delayed by internal processing, i.e., inputs 1 through 14, the SuperMatte

generator, and Framestores 1 and 2. A "delayed source" is defined as a source in the 8150 that is delayed by internal processing, i.e., M/E Program, M/E Preview, Wipe Pattern, and Key Monitor. Note that the DVE Video and Key outputs are considered direct sources if *both* DVE video inputs are fed by direct sources, but they are considered delayed sources if *either* DVE video input is fed by a delayed source.

***Aux/Txt Retime* Mode**	**DVE Video Input**	**Aux 3 Output status**	**Aux 4 Output status**	**Ch A Texture status**	**Ch B Texture status**
Aux 3/ Aux 4	Direct source (Both Ch A and B)	Timing OK for all sources	Timing OK for all sources	Source selection locked out; timing OK	Source selection locked out; timing OK
	Delayed source (Either Ch A or B)	Timing Ok for all sources	Timing OK for all sources	Selection locked out; timing not correct	Selection locked out; timing not correct
Aux 3/ Txt A	Direct source (Both Ch A and B)	Timing OK for all sources	Timing OK for all sources	Selection allowed; timing OK all sources	Selection locked out; timing OK
	Delayed source (Either Ch A or B)	Timing OK for all sources	Source selection locked out; Texture A visible	Selection allowed; timing OK all sources	Selection locked out; timing not correct
Txt A/ Txt B	Direct source (Both Ch A and B)	Timing OK for all sources	Timing Ok for all sources	Selection allowed; timing OK all sources	Selection allowed timing OK all sources
	Delayed source (Either Ch A or B)	Source selection locked out; Texture B visible	Source selection locked out; Texture A visible	Selection allowed; timing OK for all sources	Selection allowed timing OK for all sources

Lamp Saver

This softkey sets the delay (time out) for the Lamp Saver feature. If there is no Control Panel activity (no button presses or fader bar or joystick movement) for the specified duration, the system shuts off the incandescent lamps and LEDs in the Control Panel buttons. Set the delay in minutes with the **Timeout** pushknob. The range is 1 minute to 60 minutes; 10 minutes is the default.

The LCD menu display is always active, and is not affected by the Lamp Saver function.

Software Update Submenu

Use this submenu to install a software update from Accom.

> **NOTE: Software updates from Accom always include installation instructions. ALWAYS read the instructions before attempting to install new software. The procedure may require other system changes before the software installation. You should always save engineering setups, personality files, and effects to disk before installing new software; updating the system clears resident memory.**

Confirm

Press this softkey to update the device selected with the **Device** pushknob.

Update

Press this softkey to access the **Device** pushknob, which selects **None**, **Chassis**, **Panel**, or **RAM** for updating.

An 8150 software upgrade usually calls for updating the Signal Chassis software first. With the software update disk installed in the floppy disk drive, select **Chassis**, then press ***Confirm***. This automatically begins the update process for the Signal Chassis, which takes about 2 minutes. A small read-out in the upper left corner of the menu shows the update progress. When finished, the Signal Chassis reboots itself, and the Keyer 1 menu appears when it is ready for use.

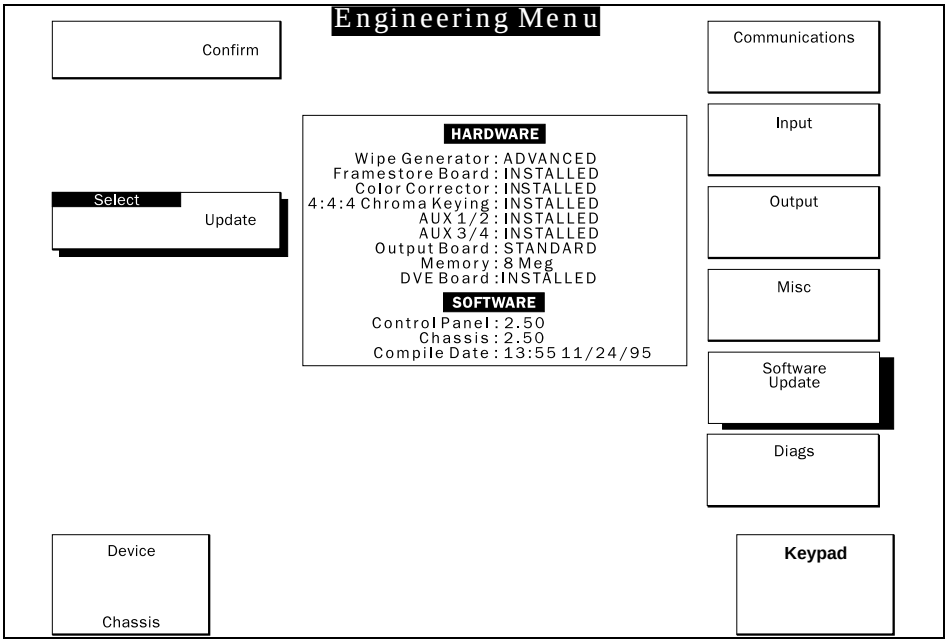


Figure 5-7 The Software Update Submenu

NOTE: There are two different versions of Chassis software on the update diskette; one version (crate. bin) is for the 8150 without the DVE CPU interface sub-board installed, and the other version (turbo.bin) is for the 8150 with the DVE CPU interface sub-board installed. The 8150 automatically recognizes and loads the correct version according to whether or not the DVE CPU interface sub-board is installed.

You can cancel the update before it reaches 96 percent complete by rebooting or powering down the Signal Chassis. The update creates a temporary file before updating the flash memory and does not affect the current software version or system memory before then. After the update is 96 percent complete, however, the existing software is erased from the flash memory, and the update must continue. Otherwise, the Signal Chassis will have no operating software at all.

The next item to update is the Control Panel software. Return to this menu, select **Panel**, then press ***Confirm***. The Control Panel update process is not totally automatic; you must press **SHIFT + M/E** at the same time when the menu prompts you to. If you do not, it aborts the update and the Control Panel reloads its existing software. Once started, the update takes about two minutes. When it is finished, the Control Panel reboots and prompts you to press **SHIFT + M/E** again. You can press the flashing **FTB** button to boot from the new software immediately, or do nothing, which causes the Control Panel to time out and boot from the new software automatically.

Like the chassis, you can cancel the Control Panel update before the display indicates that it is "erasing flash." The update creates a temporary file before updating the flash memory and does not affect the current software version or system memory before then. When it begins erasing the flash memory, however, the update must continue or the Control Panel will have no operating software at all.

The **RAM** setting erases all battery backed memory and forces all switcher settings to factory defaults. This is also known as a "first birthday." This is not a normal operation and should be used only as a last resort if other measures to fix operational problems are unsuccessful.

WARNING: Updating RAM clears the switcher's battery backed up memory. Save all engineering setups, personality files, and effects to disk before updating the RAM.

Diagnostics Submenu

This submenu lets you perform tests on the Control Panel. Normally, you will not use it, unless you suspect a fault in the Control Panel. Note that the 8150 "sees" when you press menu and crosspoint buttons while in this menu, just as it does normally.

Hold down the ***Lamp Test*** softkey to test the lamps and LEDs on the Control Panel for burn-out. As you hold the softkey, the 8150 lights each lamp and LED in succession so you can identify burnt out ones. The labels in the pushknobs let you verify that the 8150 changes values in single steps. For example, if you turn the pushknob one click, the value in the label should only increase or decrease by one unit.

The display in the center of the menu lets you test other Control Panel functions. Press a button and the "Keys" line indicates the switch number for the button. Press more than one button (up to four at a time) to verify more than one button.

The "Joy" line is a read-out of the current joystick position. When you let go of the joystick, the X, Y, and Z values should be 0, which means that the joystick has recentered itself. Note that a small amount of "drift" in the joystick is normal.

The "TBar" line lets you test the fader bar's range. The top of its range is 8000, the bottom is 0000. Intermediate settings give corresponding read-outs, in hexadecimal form.

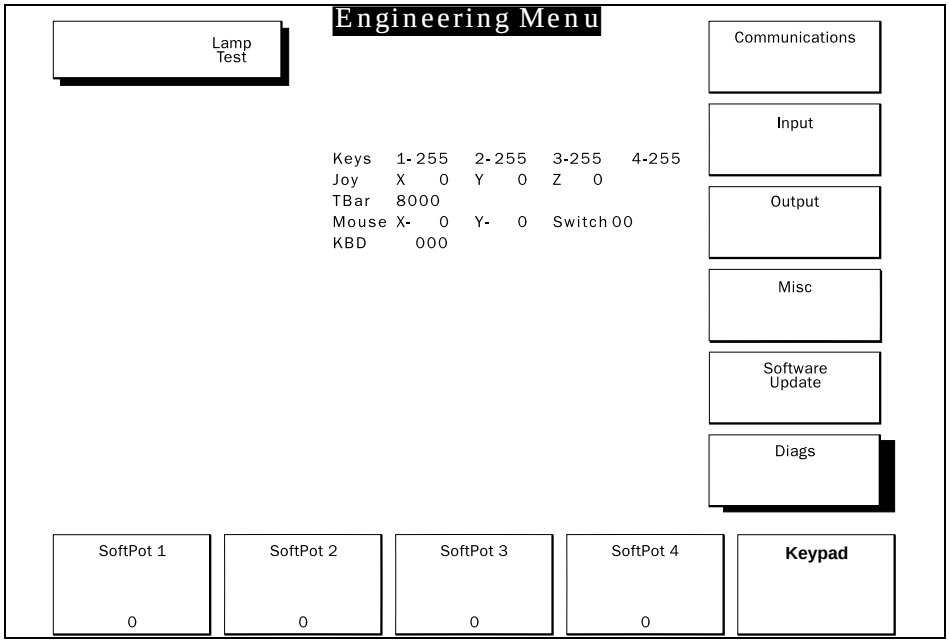


Figure 5-8 The Diags Submenu

You can add your own mouse or mouse pen for drawing masks and controlling wipes. The 8150 also supports using an external PC AT keyboard for naming sources and disk files. The Diagnostics submenu lets you verify communications between the 8150 and a mouse and/or keyboard. The "Mouse" line lets you verify that the 8150 "sees" external mouse movement and button presses. In the same way, the "KBD" line lets you verify button presses on the external keyboard.

Personality Menu

Press the **PERSONALITY** menu button to bring up this menu. You can use this menu to name and assign inputs, assign functions to the User Keys (function buttons), assign GPI input functions, enable remote ports, and select preview monitor overlays.

You can save and recall all settings and adjustments in the Personality menu as PER files on a floppy disk. See the Disk menu description later in this section for more information.

Input Names Submenu

Press this softkey to bring up the Input Names submenu. You can assign a 14-character name to each physical input. The list that appears in the middle of the display is a list of the inputs, in order, and their default names, not a list of the crosspoints as they appear on the bus rows. Note also that the module types are identified (e.g., serial-601, parallel-601, etc.) in this list, and that it does not list inputs that have no Input module installed.

Note that you can use the Keyboard connector on the back of the Control Panel to use an off-the-shelf PC AT keyboard to name inputs. Depending on your configuration, this may save considerable time. If a PC AT keyboard is not available, you can use the pushknobs to name the inputs.

Use the I**nput List** pushknob to scroll the highlight bar through the list. The highlight bar indicates the current input.

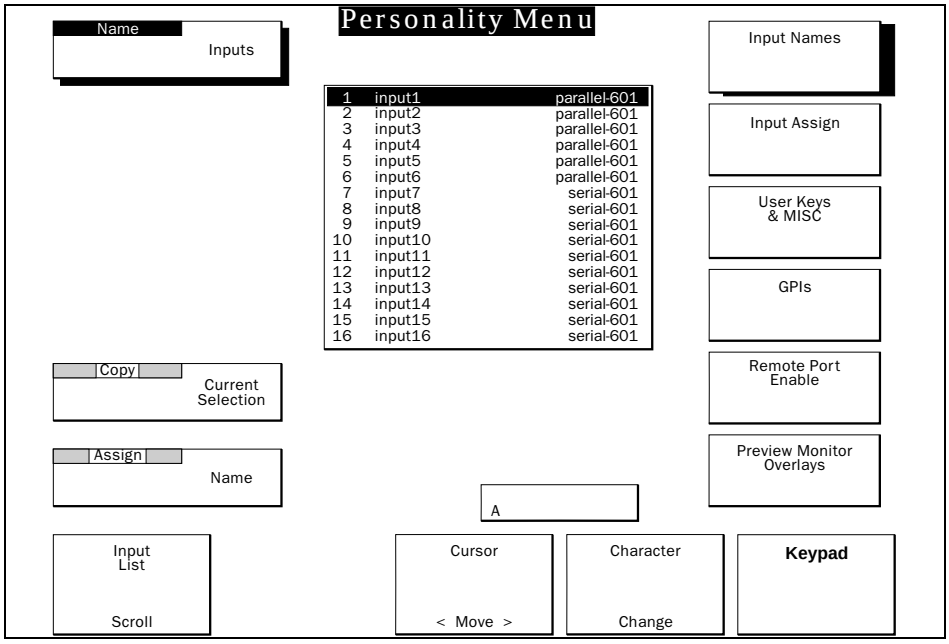


Figure 5-9 The Input Names Submenu

Use the **Cursor** pushknob to move the cursor into the naming box (if you do not have an external PC AT keyboard to name the inputs). Turn the **Cursor** pushknob to move the cursor in the naming box (above the pushknob label); push it to backspace (with delete) through the name.

Turn the **Character** pushknob to scroll through the character set. Press the pushknob to enter the character at the current cursor position.

If there is already a name in the naming box, clear it by pressing **CLEAR** (in the numeric keypad), then the **Character** pushknob. This leaves the letter A in the box, since valid file names must have at least one character. You can enter numbers in file names with the numeric keypad.

Current Selection

Press this softkey to copy the current input name from the list to the naming box. This lets you easily edit existing names.

Name

Press this softkey to assign the name in the naming box to the current input.

Input Assign Submenu

The Input Assign submenu displays the bus crosspoint assignments and lets you set which sources appear at which crosspoint buttons.

This menu shows two bus rows of nine boxes that represent the crosspoint buttons on the Control Panel. The top row represents the primary crosspoints (1 – 9), and the bottom row represents the shifted crosspoints (10 – 18). Above the boxes are the sources currently assigned to the buttons, including the input names assigned in the Input Names submenu. The black box indicates the currently selected crosspoint button on the BKGND B or PRESET bus row.

Assigning Sources to Crosspoints

STEP 1: Press the ***Input Assign*** softkey to open this submenu. Select the crosspoint button you want to assign a source to on the BKGND B or PRESET bus row. The black box in the menu indicates that crosspoint.

STEP 2: Use the **Source** pushknob to select the source you want to assign to that crosspoint. You can choose any of the external or internal sources available in the 8150.

STEP 3: Press the ***Assign*** softkey to assign the source to the selected crosspoint.

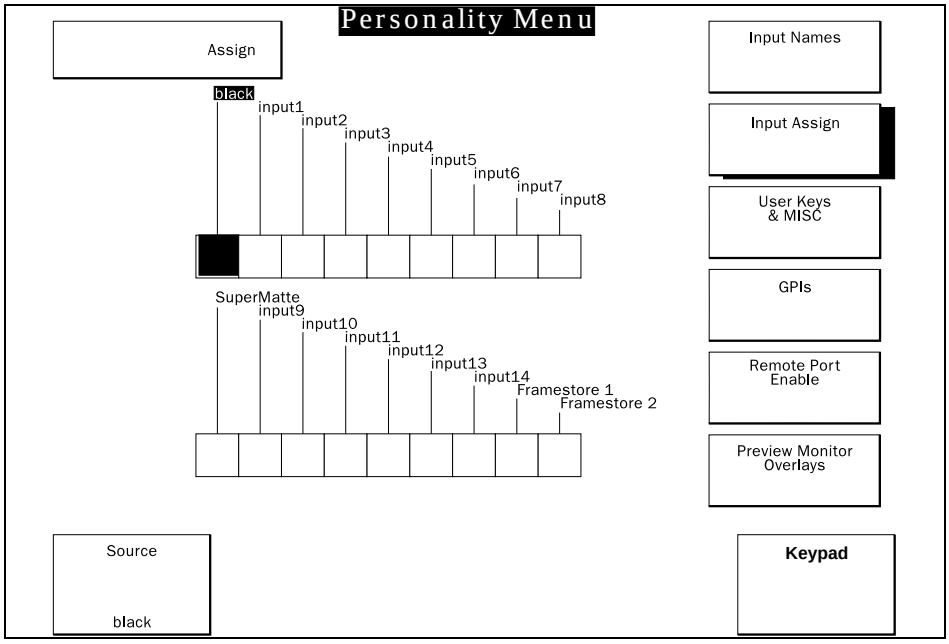


Figure 5-10 The Input Assign Submenu

User Keys & Miscellaneous Submenu

The User Keys & MISC submenu lets you record macros (commonly used button-press sequences), select certain menus for automatic recall, and disable or enable the **UNDO MENU** button.

You can assign macros of up to 50 button presses to the blue function buttons (**F1, F2, F3**) located near the joystick. After recording, pressing one of these buttons runs the macro assigned to it.

Any Control Panel button press may be included as part of a macro, including another macro button. This lets you run a macro as part of another one, and create repeating macros.

Recording a Macro

STEP 1: Use the **User Key** pushknob to select the number (**F1**, **F2**, or **F3**) you want to assign a macro to. You can also press the **F1**, **F2**, or **F3** button directly to select it. The current User Key appears in the display above the **User Key** pushknob.

STEP 2: Press the ***Record*** softkey. The 8150 now records every button press you make. As you record button presses, the name of the button just pressed appears in the list box below the menu title.

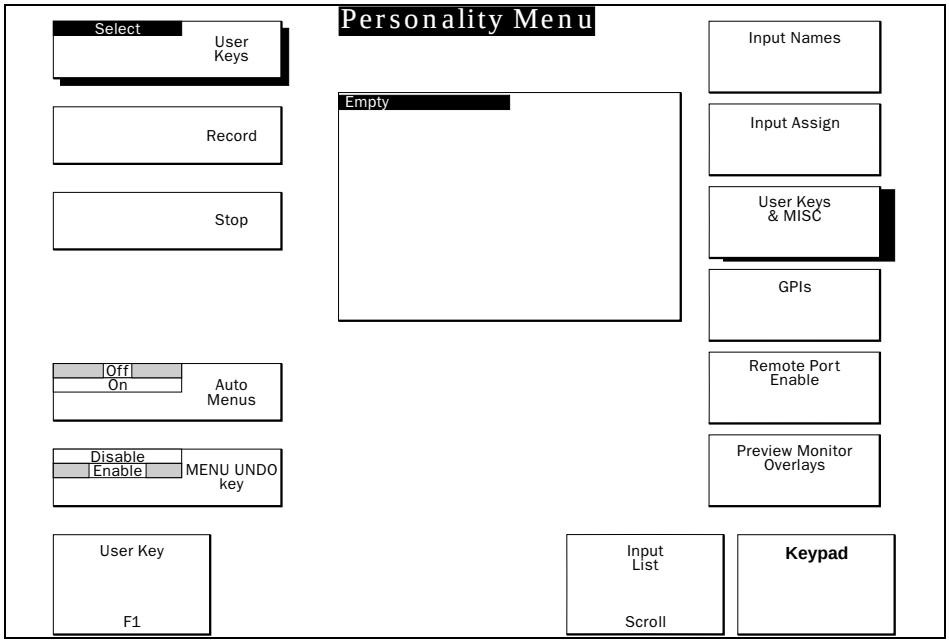


Figure 5-11 The User Keys & MISC Submenu

HINT: It is often helpful, especially when recording long macros, to create a script to follow, since you cannot edit macros after recording them.

STEP 3: If the User Keys & MISC submenu is still active, press the ***Stop*** softkey to complete the macro recording. If another menu is active, you can press the **F1**, **F2**, or **F3** button (whichever is the current macro) to stop recording. The list box in the middle of the menu lists the recorded button presses. You can now run the recorded macro by pressing the appropriate function button.

Note that the User Keys only recall button presses, not necessarily the functions selected by those button presses. For example, if you want to turn on both the Safe Area and Safe Title displays in the preview output, you press the ***Safe Area*** softkey three times. However, if you record a macro that does this, it does not remember the original setting; it only remembers that you pressed the ***Safe Area*** softkey three times. If it is set to something other than ***Off***, it toggles three times and end up at whatever setting appears after three presses. This feature is useful for recording a macro that toggles a parameter setting with each press of the function button.

To record a macro that selects the same setting for a function every time, you can start the recording by pressing and holding **CLEAR** and pressing the softkey. This sets that function to its default state, and you can then toggle the softkey to the desired setting. Now when you run the macro, it first sets the parameter to a known setting (default), then toggles to the correct setting.

After recording the macro, you can use the **Input List** pushknob to scroll through the list of macro steps (button presses).

Auto Menus

Toggling this softkey to ***On*** sets the menus to automatically come up when you press these transition select and delegation buttons: ***Off*** is the default.

- Pressing **KEY 1** recalls the Keyer 1 menu.
- Pressing **KEY 2** recalls the Keyer 2 menu.
- Pressing **DSK** recalls the DSK Keyer menu.
- Pressing **WIPE** recalls the M/E Wipes menu if the M/E buses are active, or recalls the Program/Preset Wipe menu if the PGM/PST buses are active.

MENU UNDO Key

Toggle this softkey to enable and disable the **UNDO MENU** button. With this button enabled (the default), pressing **UNDO MENU** steps backward to the last button pressed and "undoes" button presses and menu settings. You can "undo" all button presses made since you enabled this feature. If you step back too far, hold **CLEAR** while pressing **UNDO MENU** to re-do all the steps that you have just undone, one "re-do" at a time.

If the ***MENU UNDO Key*** is set to ***Disable***, you cannot step back through previous button presses and undo them with the **UNDO MENU** button. The 8150 boots up with this function enabled.

GPIs Submenu

The GPIs submenu lets you assign functions to the eight input GPIs. A GPI (general purpose interface) is simply an active-low TTL pulse or contact closure that is output by one device to trigger a function in another device. See Section 2 – Installation for information on physically interconnecting GPI inputs and outputs.

There are two boxes in this menu. The top one lists the GPIs and their current functions. The bottom one lists the functions that you can assign to the GPIs. Black highlight bars in each box indicate the current GPI input and the current function.

> **NOTE: To enable GPIs, you must enable the GPI port in the Remote Port Enables menu.**

Assign GPIs

Press this softkey to assign the current function (lower box) to the current GPI input (upper box).

Use the **GPI List** pushknob to scroll the highlight bar through the list of eight GPI inputs. The bar indicates the current GPI input.

Use the **Selection List** pushknob to scroll the highlight bar through the list of GPI input functions. The bar indicates the current function.

Input GPI Functions

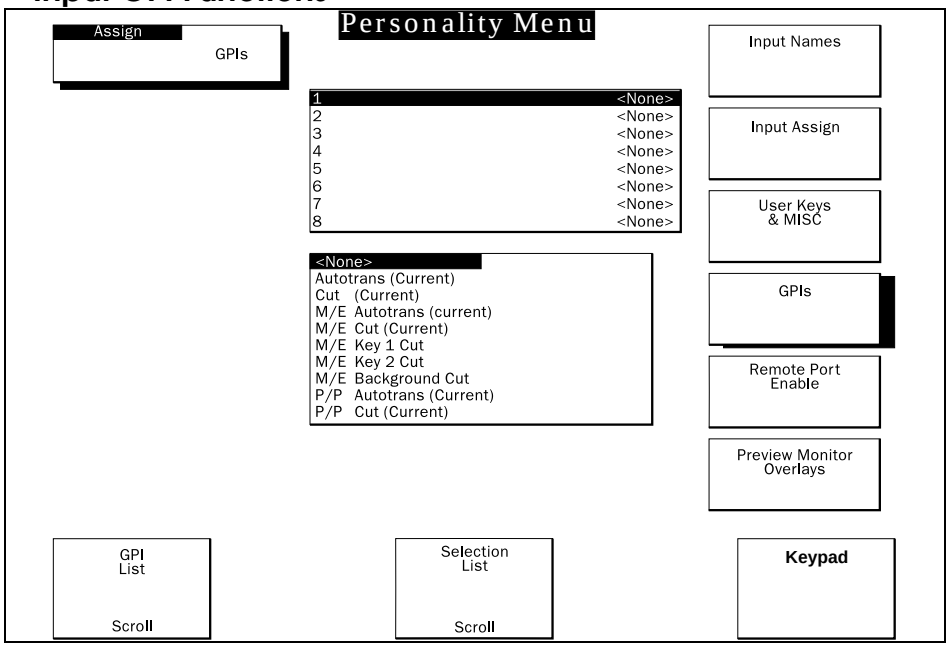


Figure 5-12 The GPIs Submenu

The functions available for GPI input triggers appear in the lower list box. Input GPIs can trigger the following functions:

- **<None>** – no function.
- **Autotrans (Current)** – executes the currently active transition, just like pressing the **AUTO TRAN** button.
- **Cut (Current)** – cuts the currently active transition, just like pressing the **CUT** button.
- **M/E Autotrans <Current>** – executes a transition on the M/E, using its currently active transition mode, just like pressing the **AUTO TRAN** button while the M/E buses are active.
- **M/E Cut <Current>** – executes a cut on the M/E, just like pressing the **CUT** button while the M/E buses are active.
- **M/E Key 1 Cut** – cuts Keyer 1 on or off on the M/E, just like pressing the **CUT** button with **KEY 1** lit.
- **M/E Key 2 Cut** – cuts Keyer 2 on or off on the M/E, just like pressing the **CUT** button with **KEY 2** lit.
- **M/E Background Cut** – cuts between the Background A and B buses on the M/E, just like pressing the **CUT** button with **BKND** lit.
- **P/P Autotrans <Current>** – executes a transition on PGM/PST, using its currently active transition mode, just like pressing the **AUTO TRAN** button.
- **P/P Cut <Current>** – cuts the PGM/PST buses, DSK, or both using the current transition mode, just like pressing the **CUT** button.
- **P/P DSK Cut** – cuts the DSK on or off, just like pressing the **CUT** button with **DSK** lit.
- **P/P Cut** – cuts Preset-to-Program on PGM/PST, just like pressing the **CUT** button with **PGM PST** lit.
- **P/P Fade-to-Black** – executes a fade-to-black on the program output, just like pressing the **FTB** button.
- **P/P Cut-to-Black** – executes a cut-to-black on the program output, just like pressing the **FTB** button with a transition duration of 0:00.
- **Grab Image in Framestore #1** – freezes Framestore 1 with its currently selected input video, just like pressing the ***Framestore #1 Freeze*** softkey in the Framestore menu.
- **Grab Image in Framestore #2** – freezes Framestore 2 with its currently selected input video, just like pressing the ***Framestore #2 Freeze*** softkey in the Framestore menu.
- **Freeze/PassThru FS #1 Switch** – toggles the state of Framestore 1 to its opposite, just like toggling between the ***Framestore #1 Mode*** and ***Framestore #1 Freeze*** softkeys in the Framestore menu.

- **Freeze/PassThru FS #2 Switch** – toggles the state of Framestore 2 to its opposite, just like toggling between the ***Framestore #2 Mode*** and ***Framestore #2 Freeze*** softkeys in the Framestore menu.
- **F1**, **F2**, **F3** – executes the macro currently assigned to a User Key, just like pressing one of these buttons (**F1**, **F2**, **F3**).
- **Aux 1 A/B Side Switch** – triggers the Aux 1 A/B (front/back) switch. This mode requires a simple state change as its input. A TTL high (or open contact) designates the A or front side, and a TTL low (or closed contact) designates the B or back side. Assign the sources for A and B in the Miscellaneous menu.
- **Aux 2 A/B Side Switch** – triggers the Aux 2 A/B (front/back) switch as above.
- **Aux 3 A/B Side Switch** – triggers the Aux 3 A/B (front/back) switch as above.
- **Aux 4 A/B Side Switch** – triggers the Aux 4 A/B (front/back) switch as above.
- **Run Effect Forward** – runs the current Timeline effect forward from the start or its current position if paused, just like pressing the **RUN** button.
- **Run Effect Reverse** – runs the current Timeline effect in reverse from the end or its current position if paused, just like pressing the **REV** button.
- **Jog Effect Forward** – steps the current Timeline effect forward one field.
- **Jog Effect Reverse** – steps the current Timeline effect backward one field.
- **Rewind Effect** – resets the current Timeline effect back to the first keyframe, just like pressing the **START (REW)** button.
- **FastFwd Effect** – sends the current Timeline effect ahead to the last keyframe, just like pressing the **END (FF)** button.
- **Previous Keyframe** – steps the current Timeline effect back to the previous keyframe, just like pressing the **PREVIOUS** button.
- **Next Keyframe** – steps the current Timeline effect ahead to the next keyframe, just like pressing the **NEXT** button.

> **NOTE: The time delay between receipt of a GPI and its execution is one frame.**

Using the A/B Side (Front/Back) Switch Function

Many DVEs have two video inputs, corresponding to a "front" side and a "back" side. The DVE typically performs a switch internally when the transformed picture rotates from its "front" side to its "back" side or vice versa. If you are feeding the DVE from a switcher, this would normally require four Aux outputs (two for video, two for key).

However, some DVEs output a "front/back" tally signal that identifies which side of the transformed video is being displayed. The 8150 can use this tally signal to perform the front/back switch internally, thus using only two Aux outputs (one for video, one for key) and freeing up the other two DVE inputs for connection to other sources.

The Accom A57 is one such DVE. To take advantage of the 8150's front/back switch feature, use the following connections and menu setups.

The A57 GPI A connector outputs its front/back tally on pins 23 (+ GPI 2 Out) and 22 (- GPI 2 Out). When connected to an external pull-up voltage, it outputs a TTL high when the transformed video is displaying the front side, and outputs a TTL low when the transformed video is displaying the back side. See the A57 Technical Guide for more information on this connector.

The 8150 GPI connector accepts eight independent GPI inputs, any of which you can configure as a front/back switch for any of the four Aux outputs. Also, since the 8150 provides a TTL level pull-up on the positive terminal of each GPI input, it automatically provides the external voltage to the A57 GPI output when used in this configuration. When you have determined which GPI input(s) you want to use for the front/back switch inputs, see the following table to determine which pins need to be connected to the A57 GPI A connector. See Section 2 – Installation for the complete 8150 GPI connector pinout.

If you are using a two channel DVE and combining those outputs with a video combiner, the relative timing of the Aux bus outputs becomes a consideration. The Aux 1 and 2 outputs are always zero timed to each other, regardless of what source is selected for them; the pair always takes the timing of the "later" (more delayed) source that is assigned to either Aux bus. Likewise, the Aux 3 and 4 outputs are always zero timed to each other, again according to the "later" of the two sources assigned to either Aux bus.

However, the relative timing of the two pairs (Aux 1/2 and Aux 3/4) are normally independent of each other, meaning that the Aux 1/2 pair could be as much as 32 lines early or late compared to the Aux 3/4 pair. If these Aux outputs are feeding two DVEs that are ultimately combined

in a video combiner, this potential timing discrepancy could cause a problem.

For this reason, there is a control in the Engineering menu Input submenu that forces all four Aux bus outputs to be zero timed to each other, again according to the "latest" source assigned to any Aux bus. In this submenu, press the ***Effects Loop Inputs*** softkey to access the **Combiner** pushknob. Set this control to **Combiner On** if using a DVE video combiner; otherwise, leave it set to **Combiner Off**.

STEP 1: You must supply a cable that connects pin 23 (+ GPI 2 Out) of the A57 GPI A connector to one or more of the eight GPI + pins (2-9) listed in the following table, and pin 22 (- GPI 2 Out) of the A57 GPI A to one or more of the common GPI return pins (14-21) listed in the following table.

Pin Number	Pin Function
1	Chassis ground
2	GPI 1 in +
3	GPI 2 in +
4	GPI 3 in +
5	GPI 4 in +
6	GPI 5 in +
7	GPI 6 in +
8	GPI 7 in +
9	GPI 8 in +
14 - 21	GPI return (common)

NOTE: If you are using two Aux outputs to feed video and key as a pair to a DVE with key channel, you may need to connect two front/back switch signals to the 8150, one for each Aux output (video and key). If you are connecting two DVEs with key channels, you may need to supply two front/back switch signals from each DVE.

STEP 2: To configure the 8150 GPI Inputs, press the ***GPIs*** softkey in the Personality menu. Use the **GPI List** pushknob to scroll the list and highlight the GPI input number to which you want to assign the front/back switch function.

STEP 3: Use the **Selection List** pushknob to scroll the list of GPI functions and highlight the appropriate function. Since the 8150 Effects Loop feature is configured so that Aux 1 and 2 feed video and key to DVE 1, and Aux 3 and 4 feed video and key to DVE 2, if connected, the GPI function you select depends on which Aux Bus outputs you are feeding to the DVE. Select **Aux 1 A/B Side Switch** for the video feed to DVE 1, select **Aux 2 A/B Side Switch** for the key feed to DVE 1, select **Aux 3 A/B Side Switch** for the video feed to DVE 2, or select **Aux 4 A/B Side Switch** for the key feed to DVE 2.

STEP 4: After highlighting the GPI function and the GPI input to which you want to assign that function, press the ***Assign*** softkey to enter the assignment. Repeat steps 2 and 3 for any other Aux outputs that require front/back switching.

STEP 5: In the Remote Port Enables submenu, toggle the ***GPIs*** softkey to ***On***. The front/back switch does not work unless GPIs are enabled.

STEP 6: To select the front and back sources for the Aux outputs, press the ***Aux Buses*** softkey in the Miscellaneous menu. Press the ***Sources*** softkey to bring up the source control pushknobs (**Aux 1**, **Aux 2**, **Aux 3**, and **Aux 4**).

STEP 7: Press the ***Side*** softkey to toggle it to ***Front***.

STEP 8: Using the pushknob for the highlighted Aux output(s), select the source that you want to feed when the DVE is on its front side. If the source is assigned to a crosspoint button, you can press and hold that button on the Background B or Preset bus row and press the source pushknob to set the source directly.

STEP 9: Toggle the ***Side*** softkey to ***Back***.

STEP 10: Repeat step 8 to assign the source for the back side of the DVE.

STEP 11: To test the front/back switch setup, press the crosspoint button assigned to the DVE on the 8150 Program bus to view

it. Rotate the DVE video so that the front and back sides alternate on screen. The sources you selected for front and back should appear in the DVE at the appropriate times. Also, if the DVE is equipped with a key channel and it is turned on, you can press the crosspoint button assigned to the DVE key input to view the key front/back switch. Note also that the center of this menu displays "Front" or "Back" for the appropriate Aux outputs to indicate which side the DVE has requested via the GPIs.

STEP 12: If the GPI setups are correct, you can use the Disk menu to save them as Personality menu settings in a PER file for easy recall later. See the Disk menu description later in this section for more information. You can save the Aux bus source settings as a snapshot keyframe or Timeline effect. See Section 10 – Timelines in the 8150 Operations Manual for more information on saving and recalling snapshot keyframes and Timeline effects.

NOTE: If the DVE sending the front/back switch signal is also used in an Effects Loop, the Loop Select pushknob, which you recall with the *Effects Loop Inputs* softkey, overrides the existing source selections. See Section 6 – System Timing, for more information on effects looping.

Using GPI Outputs

You can send up to eight independent GPIs to other devices as part of a Timeline effect. The 8150 can fire any or all GPOs (output GPIs) at the beginning of any keyframe on its assigned Timeline.

This example demonstrates how to assign a GPI output to a keyframe:

STEP 1: In the Personality menu, press the ***Remote Port Enables*** softkey. Toggle the ***GPIs*** softkey to ***On***. This activates the GPI output port.

STEP 2: In the Timeline menu, press the ***Display Timelines*** softkey to view the Timeline graphic display.

STEP 3: Use the **PREVIOUS** or **NEXT** buttons (near the fader bar) to move the Timeline cursor to Keyframe 2.

STEP 4: Press the ***Events*** softkey. Turn the **Select GPO** pushknob to select GPI **1**.

STEP 5: Press the ***Toggle GPO*** softkey. Note that the **GPO Select** display changes from **None** to **1– – – – – – –**. This indicates that GPI Output 1 is selected.

STEP 6: Turn the **Select GPO** pushknob to select the GPI **4** output, and press ***Toggle GPO*** again. Note that **GPO Select** now displays **1 – – 4 – – – –**, indicating that GPI outputs 1 and 4 are selected.

STEP 7: Press the Quick Keyframes **MODIFY** button to modify Keyframe 2 (which you selected in step 2) to trigger GPI outputs 1 and 4.

STEP 8: Run the effect by pressing the **RUN** button. The **GPO Select** display reads **None** until it reaches Keyframe 2, when it changes to **1 – – 4 – – –** . When it reaches Keyframe 3, it reverts to **None** again for the rest of the effect. Any external device whose GPI input is connected to GPI outputs 1 or 4 is triggered at Keyframe 2 of this effect.

STEP 9: Repeat steps 6 and 7 to add more GPI outputs or trigger GPIs on other keyframes. Numbers in the **GPO Select** display indicate that those GPI outputs are active if saved as part of a keyframe. To remove GPI outputs from a keyframe, select the GPI output number with **Select GPO** and press ***Toggle GPO*** to remove the number from the **GPO Select** display. Press the Quick Keyframes **MODIFY** button to disable that GPO for that keyframe.

Remote Port Enables Submenu

This submenu lets you enable and disable the remote ports. See the Installation section for more information on setting up these ports.

Port 1

Toggle this softkey to enable/disable the port marked "SERIAL 1" on the back of the Signal Chassis. ***On*** is the default.

Port 2

Toggle this softkey to enable/disable the port marked "SERIAL 2" on the back of the Signal Chassis. ***On*** is the default.

Port 3

Toggle this softkey to enable/disable the port marked "SERIAL 3 (LINC)" on the back of the Signal Chassis. ***On*** is the default.

GPIs

Toggle this softkey to enable/disable the GPIs (input triggers). ***Off*** is the default.

GPOs

Toggle this softkey to enable/disable the GPOs (output triggers). ***Off*** is the default.

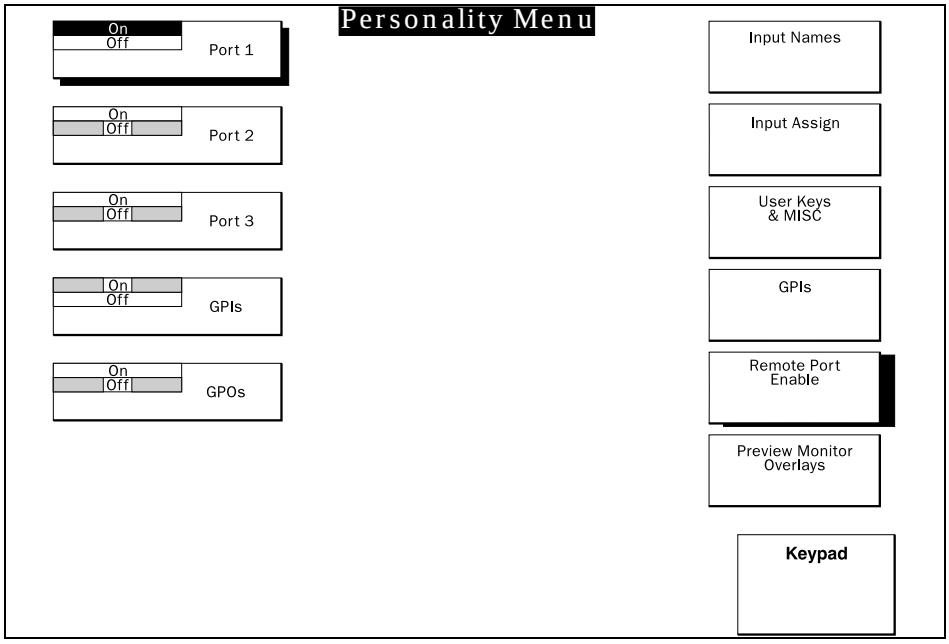


Figure 5-13 The Remote Port Enables Submenu

Preview Monitor Overlays Submenu

The preview monitor overlays are tools for picture conformation and composition. These overlays appear only in the preview output.

Safe Action

Toggle this softkey to enable the ***Safe Action*** area boundary, the ***Safe Title*** area boundary, or ***Both***. The safe action boundary is located 5 percent in from each edge of the active picture; the safe title boundary is located 10 percent in from each edge of the active picture, according to SMPTE RP27.3.

Grid Overlay

Toggle this softkey to turn on a 6x8 grid or a large crosshair cursor fixed in the center of the screen. If the video aspect ratio is set to 16:9, the grid is 16x9.

Overlay Color

Toggle this softkey to select black or white as the color for the grid and center crosshair.

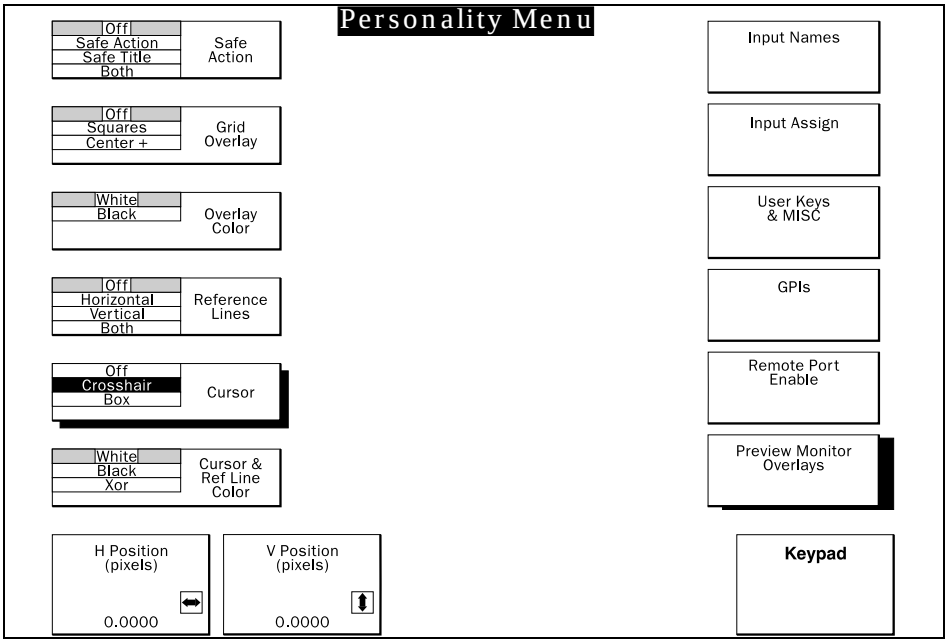


Figure 5-14 The Preview Monitor Overlays Submenu

Reference Lines

Toggle this softkey to enable reference lines, which are useful for placing screen objects precisely. The position values default to 0 for the exact center of the screen. Position values align with the grid overlay pattern; integer position values coincide with the fixed lines in the grid. You can select the following combinations of reference lines:

Horizontal enables two horizontal lines, with **Bottom Line Position** and **Top Line Position** pushknobs. The lines cannot exchange positions; if one line meets the other, it "pushes" it along with it.

Vertical enables two vertical lines, with **Left Line Position** and **Right Line Position** pushknobs. The lines cannot exchange positions; if one line meets the other, it "pushes" it along with it.

Toggling to ***Both*** enables one horizontal and one vertical line, with **H Position** and **V Position** pushknobs.

> **NOTE: If the Crosshair or Box Cursor is turned on, the Reference Lines are not visible.**

Cursor

Toggle this softkey to turn on the movable (color pick) crosshair or box. This overlay uses the same circuitry as the reference lines, so if the Crosshair or Box is turned on, the reference lines are not visible.

Cursor & Ref Line Color

Toggle this softkey to set the color pick cursor color to ***White***, ***Black***, or ***Xor***. If you select ***Xor*** (the default), the cursor automatically changes to black or white according to the luminance level of the video over which it is superimposed.

Disk Drive Operations

Press the **DISK** menu button to access all 8150 floppy disk operations, except software updates. These you can control from the Engineering menu, as described earlier in this section. The 8150 uses a 3.5" floppy disk drive built into the right side of the Control Panel, an optional external floppy disk drive that you can connect to the rear of the Control Panel, or an optional hard disk drive located in the Signal Chassis. The floppy drive supports 720KB and 1.44MB DOS format floppy disks, letting you manage files off-line on a PC. The hard disk is a 3.5" 1GB SCSI drive initialized at the factory by Accom. The ability to save and recall setups to and from disk makes changing switcher configurations easy.

When you press the **DISK** menu button, the 8150 checks to see if there is a disk present if one of the floppy drives is selected. If so, it displays the floppy disk files with the selected extension in the center of the menu. If the hard drive is installed and selected, it displays its files with the selected extension in the center of the menu.

> **NOTE: You should always save engineering setup, personality, and effect files to disk before performing a system update or removing the Main board from the Signal Chassis. Both these actions clear the battery backed memory in the 8150.**

If you are using the Disk menu for the first time, set the current date and time with the ***Misc*** softkey in the Disk menu, as described below. If you have an unformatted floppy disk, you can format it in the Format submenu, or with a DOS compatible personal computer. The 8150 can format either 720KB or 1.44MB disks.

The menu also lets you name and add comments to disk files. If you have a PC AT keyboard with a 5-pin DIN connector, you can connect it to the rear Control Panel KEYBOARD port and use it to enter file names and comments.

Setting the Date and Time

STEP 1: Press the **DISK** menu button, then the ***Misc*** softkey.

STEP 2: Press the ***Date*** softkey and select today's date with the **Month**, **Day**, and **Year** pushknobs. The display shows the month, day, and year, in that order.

STEP 3: Press the ***Time*** softkey and select the current time with the **Hour (00-23)** and **Minute** pushknobs. The 8150 uses a 24-hour clock, where midnight is 00:00, 6 AM is 06:00, noon is 12:00, and 6 PM is 18:00.

STEP 4: After entering the current date and time, press the ***Date & Time*** softkey. This enters the settings into the 8150's real-time clock, where it is not disturbed, even if the battery backed RAM is cleared. Whenever you save a file to floppy disk, it is "stamped" with the current date and time according to these settings.

Formatting a Disk

STEP 1: Insert a blank floppy disk, either 720KB or 1.44MB, into the floppy disk drive (internal or external, if connected).

STEP 2: Press the **DISK** menu button, then the ***Format*** softkey. If an external disk drive is connected, make sure that you select the correct drive with the ***Drive*** softkey.

STEP 3: Press the ***Confirm*** softkey; the prompt "are you sure you want to do this?" appears. To continue, press the ***Confirm*** softkey again. Press any other button to abort the format command.

STEP 4: If you press ***Confirm*** again, the prompt "formatting: A:" appears if you are formatting with the internal disk drive; "formatting: B:" appears if you are using the optional external drive to format the disk; "formatting: C:" appears if you are formatting the optional hard disk. Since the hard disk is already formatted by Accom, you probably will never need to format it.

STEP 5: When the formatting process is complete, the display adds the word ". . . done" to the "formatting" prompt. You may remove the disk and format another, or save files to this disk.

Creating Disk Subdirectories

STEP 1: Insert a formatted floppy into the internal disk drive or the external drive, if connected.

STEP 2: Press the ***Directory*** softkey to bring up the Directory submenu. Press the ***Make Directory*** softkey on the left side of the display.

STEP 3: You can use a standard PC AT keyboard to assign an 8-character name (DOS compatible) to the directory. If a PC AT keyboard is not available, you can name the file with the **Cursor** and **Character** pushknobs. Use the **Cursor** pushknob to move the cursor in the naming box. Turn the **Character** pushknob to select a character. Push it to enter the current character in the current cursor position. To clear the naming box, press the **CLEAR** button in the numeric keypad, then the **Character** pushknob.

STEP 4: Press the ***Confirm*** softkey to create the new directory. Note that you have not changed to the new directory, only created it.

STEP 5: To change to the new directory, press the ***Change Directory*** softkey and use the **Directory List** pushknob to highlight the directory name. Press the ***Confirm*** softkey to change to the selected directory.

To remove a directory, follow the above steps, but press the ***Remove Directory*** softkey instead of the ***Make Directory*** softkey.

Saving Files to Disk

You can save many different types of files to the floppy and hard disk drives. Files that you can save are ENG (engineering), PER (personality), EFF (effect), WIP (user wipe), CCR (user color corrector), KEY (user keyer), MAT (user SuperMatte), TIM (timeline), and three image file types: TIF (Tag Image File), YUV (8-bit video), and Y10 (10-bit video).

See the following table for typical file sizes. Note that these sizes may change in future software versions.

File Type	File Size in Bytes
EFF	9796
TIM	varies with number of keyframes
WIP	660
CCR	664
PER	3552
ENG	1552
TIF	varies with image content
YUV	699,840 (525) or 829,440 (625)
Y10	874,800 (525) or 1,036,800 (625)
KEY	708
MAT	348

The ability to save full frame images to disk is a powerful feature. The YUV and Y10 file types save a frame in the 8150's native format (luminance and color difference) at either 8-bit (YUV) or 10-bit (Y10) uncompressed resolution. A YUV or Y10 file takes about three seconds to save and recall on the hard disk, but takes about six and one half minutes to save, and about three and one half minutes to recall, on a floppy disk.

TIFF (Tag Image File Format) was developed by Aldus and Microsoft for use by PC, Macintosh, and Unix platforms for desktop publishing and graphic arts. There are several classes of TIF files, including monochrome, gray scale, palette-based color, and RGB color. The 8150 can read and recall all types of TIF files, including TIFF-B (monochrome), TIFF-G (gray scale), TIFF-P (palette-based color), and TIFF-R (RGB color). However, it saves them only as compressed TIFF-R (24-bit RGB, 8 bits per color) files.

When the 8150 saves a TIF image file, it is smaller than a YUV or Y10 file. However, since the amount of compression varies with image content, the file size varies also, and it takes significantly longer to save and recall to the hard disk than the other two image file types. We recommend that you save an image as a TIF file only if you expect to export it to a computer for further processing. The save and recall time for a TIF file varies due to image content, but typically takes the same amount of time as a YUV or Y10 file, due to the floppy disk transfer speed.

Save a file to disk as follows:

STEP 1: Insert a formatted floppy into the internal disk drive or the external drive, if connected.

STEP 2: Press the ***Save Recall*** softkey to bring up the Save Recall submenu. Press the ***Save*** softkey on the left side of the display.

STEP 3: If the external floppy disk drive is connected or the hard disk drive is installed, use the ***Drive*** softkey to the select the drive to which you want to save the file(s).

STEP 4: Use the **File Type** pushknob to select the type of file you want to save. These are the file types available:

EFF – Effect file. Use the **Register Number** pushknob to select the effect register (0 - 24) that you want to save to disk.
TIM – Timeline file. Use the **Register Number** pushknob to select the Timeline effect number (0 - 99) that you want to save to disk.
WIP – User Wipe file; use the **Register Number** pushknob to select the User Wipe register (1 - 20) that you want to save to disk.
CCR – User Color Corrector file; use the **Register Number** pushknob to select the User Color Corrector register (1 - 20) that you want to save to disk.
PER – Personality menu settings file.
ENG – Engineering menu settings file.
TIF – Compressed computer image file. Use the **Register Number** pushknob to select which Framestore video (1 or 2) you want to save to disk.
YUV – Full frame 8-bit uncompressed image file; use the **Register Number** pushknob to select which Framestore video (1 or 2) you want to save to disk.
Y10 – Full frame 10-bit uncompressed image file; use the **Register Number** pushknob to select which Framestore video (1 or 2) you want to save to disk.
KEY – User Key file; use the **Register Number** pushknob to select the User Key register (1 - 20) that you want to save to disk.
MAT – User SuperMatte file; use the **Register Number** pushknob to select the User SuperMatte register (1 - 20) that you want to save to disk.

STEP 5: You can use a standard PC AT keyboard to assign an 8-character name (DOS compatible) to the file. If a PC AT keyboard is not available, you can name the file with the **Cursor** and **Character** pushknobs. Use the **Cursor** pushknob to move the cursor in the naming box. Turn the **Character** pushknob to select a character. Push it to enter the current character in the current cursor position. To clear the naming box, press the **CLEAR** button in the numeric keypad, then the **Character** pushknob.

The 8150 automatically adds the file extension based on the file type currently selected, and stamps it with the current time and date.

STEP 6: Press the ***Confirm*** softkey to save the file. The 8150 prompts if a file with the same name already exists on the disk. Press **ENTER** in the TimeFrame Effects Editor area to overwrite the existing file. The menu display indicates that the 8150 is saving the file. The prompt " . . . done" appears when the save is finished.

Recalling Files from Disk

STEP 1: Insert the floppy with the files you want to recall into the internal disk drive, or the external drive if connected.

STEP 2: Press the **DISK** menu button, then the ***Save Recall*** softkey. Press the ***Recall*** softkey on the left side of the display.

STEP 3: If the external disk drive is connected, or the hard disk drive is installed, use the ***Drive*** softkey to select the drive from which you want to recall the file(s).

STEP 4: Use the **File Type** pushknob to list the file type you want to recall. See the earlier discussion, "Saving Files to Disk," for a list of available file types.

STEP 5: Use the **File List** pushknob to move the black highlight bar through the file list and choose the file you want to recall.

STEP 6: Press the ***Confirm*** softkey to recall the file. The menu display indicates that the 8150 is recalling the file, and prompts ". . . done" when it is finished.

Deleting Files from Disk

You can use this function to delete unwanted or unneeded files from a floppy disk.

> **NOTE: The 8150 does not have an "undelete" function. After deleting a file, you cannot use the 8150 to bring it back. However, the "undelete" facility on many PCs should let you recover deleted files if you have not written over them.**

STEP 1: Insert the floppy disk with the files that you want to delete into the Control Panel internal drive, or external if connected.

STEP 2: Press the **DISK** menu button, then the ***Delete*** softkey to recall the Delete submenu.

STEP 3: If the external disk drive is connected, or the hard disk is installed, select the drive from which you want to delete the file(s) with the ***Drive*** softkey.

STEP 4: Use the **File Type** pushknob to select the type of file you want to delete. See the discussion "Saving Files to Disk" for a list of available file types.

STEP 5: Use the **File List** pushknob to move the black highlight bar through the file list and select the one you want to delete.

WARNING: The 8150 does not prompt you to confirm a deletion, and deleting a file is not reversible. Make sure that the correct file is highlighted before pressing the *Confirm* softkey.

STEP 6: Press the ***Confirm*** softkey to delete the file. The menu display indicates that the 8150 is deleting the file, and prompts ". . . done" when it is finished.

Adding Comments to a Disk File

You can add comments of up to 80 characters to each 8150 disk file. The file must already be saved on the disk before you can add comments to it. You cannot save comments to a file that you have not yet saved. You also cannot add comments to an image (TIF, YUV, or Y10) file.

The 8150 saves comments as ASCII text at the beginning of each file. If you are archiving files on a PC, you can use the DOS "type" command to view a file's comments.

STEP 1: Press the **DISK** menu button, then the ***Save Recall*** softkey.

STEP 2: Press the ***Comments*** softkey and scroll through the list with the **File List** pushknob and highlight the file to which you want to add comments. The large "comment box" appears in the lower part of the menu display.

STEP 3: If you have a PC AT keyboard connected to the Control Panel rear Keyboard port, you can enter comments of up to 80 characters in length. If a PC AT keyboard is not available, you can use the **Cursor** and **Character** pushknobs to enter comments into the comment box. The **Cursor** pushknob moves the cursor in the comment box. Turn the **Character** pushknob to select the character, and press it to enter the character at the current cursor position.

STEP 4: After typing the comments, press the ***Confirm*** softkey to save the comments with the highlighted disk file. The time and date stamp is not updated when you add the comment.

Showing Disk File Comments

STEP 1: Press the **DISK** menu button, then the ***Save Recall*** softkey.

STEP 2: Press the ***Recall File*** softkey and scroll through the file list with the **File List** pushknob and highlight the file whose comments you want to show.

STEP 3: Press the ***Comment*** softkey. The "comment box" appears in the lower part of the menu display with the file's comment, if any.

Saving Multiple Disk Files with One Command

To save more than one register of the same type to the disk, you can specify a range of registers to save. All registers in this range are saved with a common file name, to which the 8150 adds a two digit number according to each register's place in the range. For instance, if you want to save eight registers in the range 3 through 10, you assign a single file name, to which the 8150 adds the numbers 01 through 08, to indicate in what order the registers originally appeared.

Follow these steps to save multiple files of the same type to disk with a single command.

STEP 1: In the Disk menu, press the ***Save Recall*** softkey, followed by the ***Save*** softkey.

STEP 2: To specify the range of registers that you want to save, use the numeric keypad to type the number of the first register in the range, followed by the decimal point, followed by the number of the last register in the range. Then press the **Register Number** pushknob to enter the range.

For instance, to specify registers 3 through 10, type **3 – . – 10**, then press **Register Number**. The pushknob display now reads **3 thru 10**.

STEP 3: Turn the **File Type** pushknob to select the type of file you want to save. You can save a range of registers of any file type except for **PER**(sonality) and **ENG**(ineering), which each have only one register available. Note that you can save a range of image files (**TIF**, **YUV**, or **Y10**), but the range is limited to two, since there are only two framestores (registers) in the system.

STEP 4: Using the **Cursor** and **Character** pushknobs, or an external PC AT keyboard connected to the Control Panel, type a file name, which all registers in the specified range will use when saved to disk. A two digit number is automatically added to the file name to indicate the order that each register has in the sequence. If you type a name longer than six characters, this two digit number replaces the seventh and eighth characters in the original file name.

For instance, for a range of timeline effect registers using the file name ENDING.TIM, the files on on the disk appear as ENDING01.TIM, ENDING02.TIM, etc. However, if the file

name is CLOSINGS.TIM, the files on disk appear as CLOSIN01.TIM, CLOSIN02.TIM, etc.

STEP 5: Press the ***Confirm*** softkey. This saves all registers in the specified range to the disk with the file name that you entered, including the two digit number as described above. The menu prompts when it is done.

Recalling Multiple Disk Files with One Command

To recall more than one register of the same type from the disk, you can specify a range of registers to which you want to recall those files. The files must be adjacent in the file list for this feature to work. For instance, if you want to recall eight files of the same type from the disk to registers 3 through 10, those eight files must be next to each other in the list. You specify a range of registers to which you want to recall those files, and the files are recalled in the order in which they appear in the list.

Follow these steps to recall multiple files of the same type with a single command.

STEP 1: In the Disk menu, press the ***Save Recall*** softkey, followed by the ***Recall*** softkey.

STEP 2: To specify the range of registers to which you want to recall the files, use the numeric keypad to type the number of the first register in the range, followed by the decimal point, followed by the number of the last register in the range. Then press the **Register Number** pushknob to enter the range.

For instance, to specify registers 3 through 10, type **3 – . – 10**, then press **Register Number**. The pushknob display now reads **3 thru 10**.

STEP 3: Turn the **File Type** pushknob to select the type of file you want to recall. You can recall a range of any file type except for **PER**(sonality) and **ENG**(ineering), which each have only one register available. Note that you can recall a range of image files (**TIF**, **YUV**, or **Y10**), but the range is limited to two, since there are only two framestores (registers) in the system.

> **NOTE: Do not select ALL as the file type. If there are files of different types in the list, they will not be recalled correctly.**

STEP 4: Turn the **File List** pushknob to select the first file of the range that you want to recall. That file is highlighted, and in addition, a range of files below the first file is highlighted, indicating which files will be recalled into the specified range of registers. You cannot "mark" or otherwise specify files that do not directly follow the first file.

For example, if the range that appears in the **Register Number** pushknob display is **3 thru 10** (a total of eight registers), the selected file name plus the next seven are highlighted to indicate that these are the files that will be recalled into registers 3 through 10.

STEP 5: Press the ***Confirm*** softkey. This recalls all highlighted files to the range of registers that you specified. The menu prompts when it is done.

The Disk Menu

This section describes each control in the Disk menu. You can use this menu to format disks, save, recall, and delete files, add and display file comments, and set the system time and date.

Press the green **DISK** menu button to bring up the Disk menu.

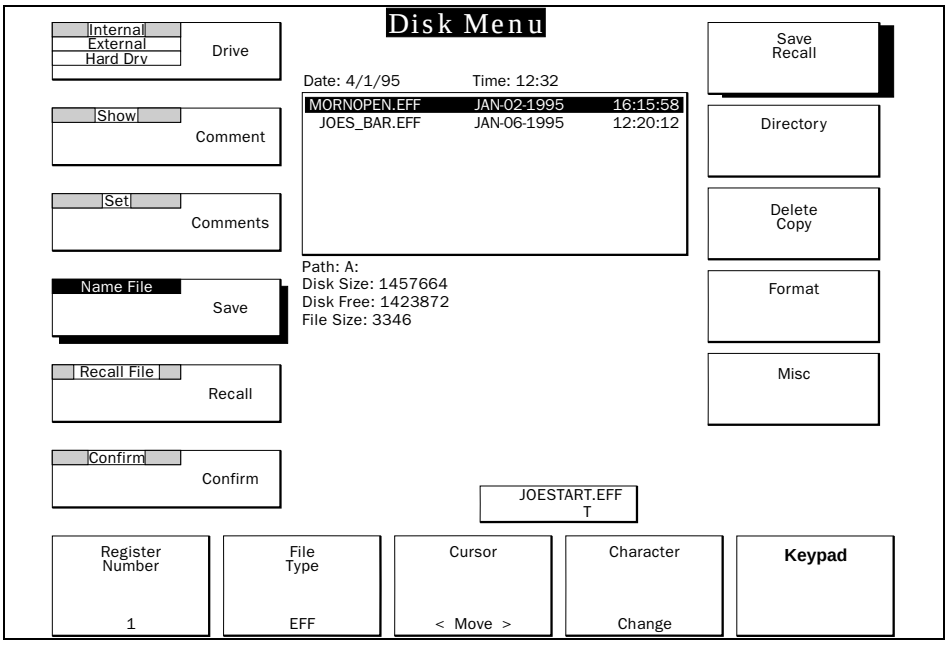


Figure 5-15 The Disk Menu

Save Recall Submenu

Use the ***Save Recall*** softkey to name, save, recall, and add or read comments on disk files.

Drive

This softkey selects the built-in disk drive (***Internal***), an optional floppy drive connected to the rear of the Control Panel (***External***), or an optional 1GB hard disk drive (***Hard Drv***) installed in the Signal Chassis. The default selection is ***Internal***; however, if you change the selection, it returns to this selection whenever you access the Disk menu.

Comment

Use this softkey with the ***Recall File*** softkey. When you highlight a disk file with the ***Recall File*** softkey, press ***Comment*** to view the highlighted file's comments.

Comments

Press this softkey to add comments to an existing file, using an external PC AT keyboard or the **File List**, **Cursor**, and **Character** pushknobs. You cannot save a comment with an image (TIF, YUV, or Y10) file. See the tutorial earlier in this section for a step-by-step procedure.

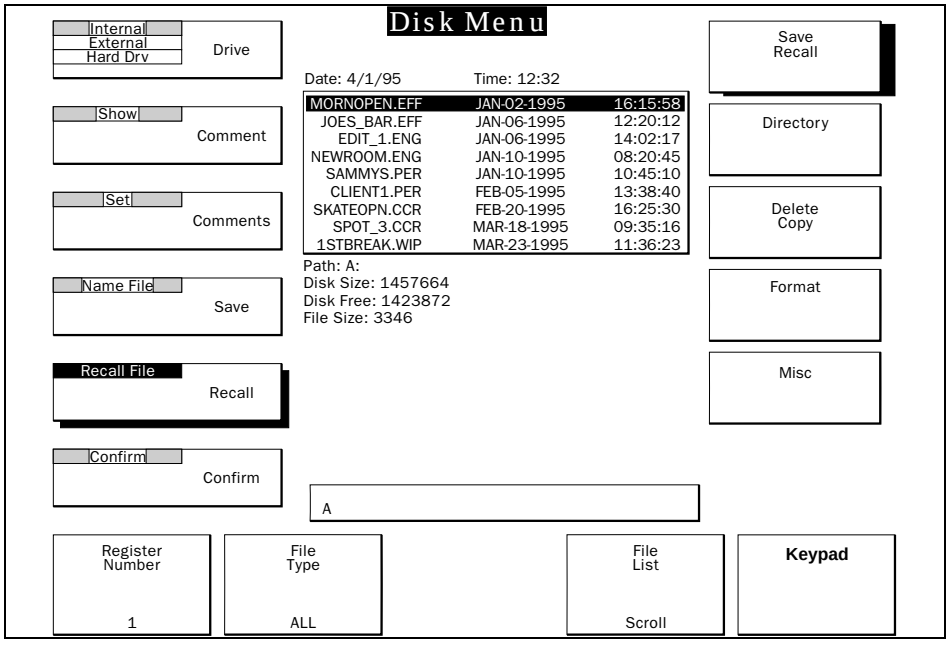


Figure 5-16 The Save / Recall Submenu

Save

Press this softkey to name and save a new file to the disk. The **Register Number** pushknob selects which register, if applicable, you want to save to disk. You can specify a range of registers by typing the first number in the range, followed by the decimal point, followed by the last number in the range; pressing **Register Number** enters this range.

The **File Type** pushknob selects the type of 8150 file you want to save, and automatically adds the correct filename extension. The **Cursor** and **Character** pushknobs let you enter a standard DOS eight character filename if you do not have a PC AT keyboard available. The 8150 prompts if a file with the same name already exists on the disk. Press **ENTER** in the TimeFrame Effects Editor area to overwrite the existing file. Pressing any other button aborts the save.

Recall

Press this softkey to recall a file from the disk. The **Register Number** pushknob selects the register to which you want to restore the disk file. It does not have to be the same register from which it was originally saved, except for PER and ENG files, which each have only one register. You can specify a range of registers by typing the first number in the range, followed by the decimal point, followed by the last number in the range; pressing **Register Number** enters this range.

The **File Type** pushknob lets you list only the files with the selected extension. The **File List** pushknob selects the file for recall from the menu file list.

Confirm

Press this softkey to execute or enter the current command or text. This softkey is similar to the "ENTER" or "RETURN" button on a keyboard.

Directory Submenu

Press the ***Directory*** softkey to create, remove, or change directories on the disk drives.

Drive

This softkey serves the same function as in the Save Recall submenu.

Make Directory

This softkey creates a new directory on the floppy disk or optional hard disk. The **Cursor** and **Character** pushknobs let you enter a standard DOS eight character directory name if you do not have a PC AT keyboard.

Remove Directory

Press this softkey to remove a directory from the floppy disk or optional hard disk. The **Directory List** pushknob lets you scroll through a list of directories and highlight the one you want to delete.

Change Directory

Press this softkey to change from the current directory on a floppy disk or hard disk to another directory on the same disk. The **Directory List** pushknob lets you scroll through a list of directories and highlight the one to which you want to change.

Confirm

Press this softkey to execute or enter the current command. This softkey is similar to the "ENTER" or "RETURN" button on a keyboard.

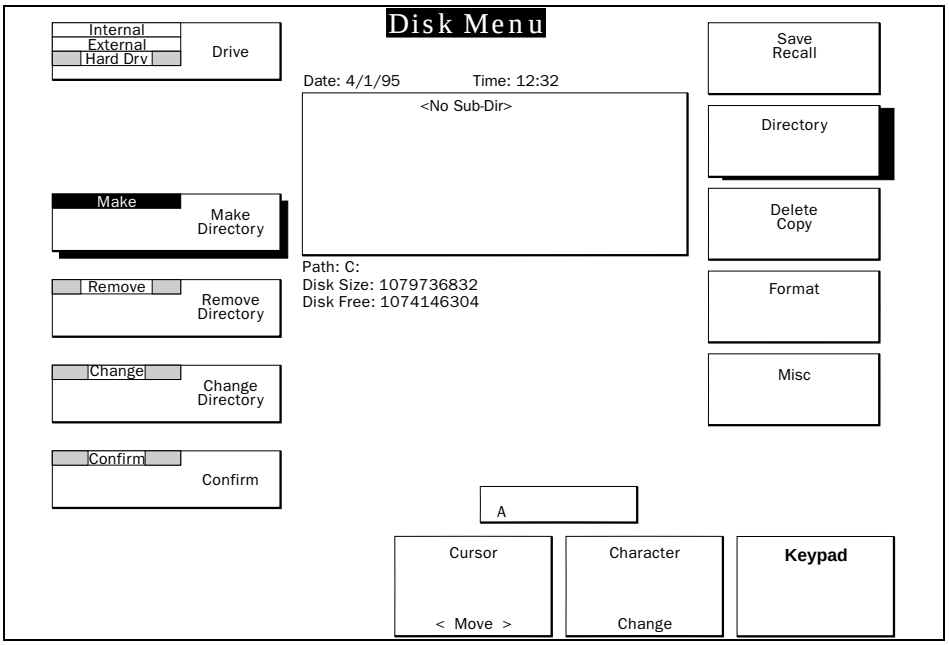


Figure 5-17 The Directory Submenu

Delete Copy Submenu

Use the ***Delete Copy*** softkey to delete unwanted files from a disk, or to copy files from one disk to another.

Drive

This softkey serves the same function as in the Save Recall submenu.

From

Press this softkey to bring up the **File Type** and **File List** pushknobs. Use the pushknobs to highlight the file that you want to copy. Press the ***Confirm*** softkey to enter the selection. The prompt "copy file [filename.ext]" appears to confirm your selection.

To

Press this softkey to select the drive to which you want to copy the file selected with the ***From*** softkey. Use the ***Drive*** softkey to select the drive, and press the ***Confirm*** softkey to actually copy the file. The prompt "copy file [filename.ext] to [a:/filename.ext]" appears to confirm that the file is being copied to the indicated disk drive (a:, b:, or c:) with the indicated file name.

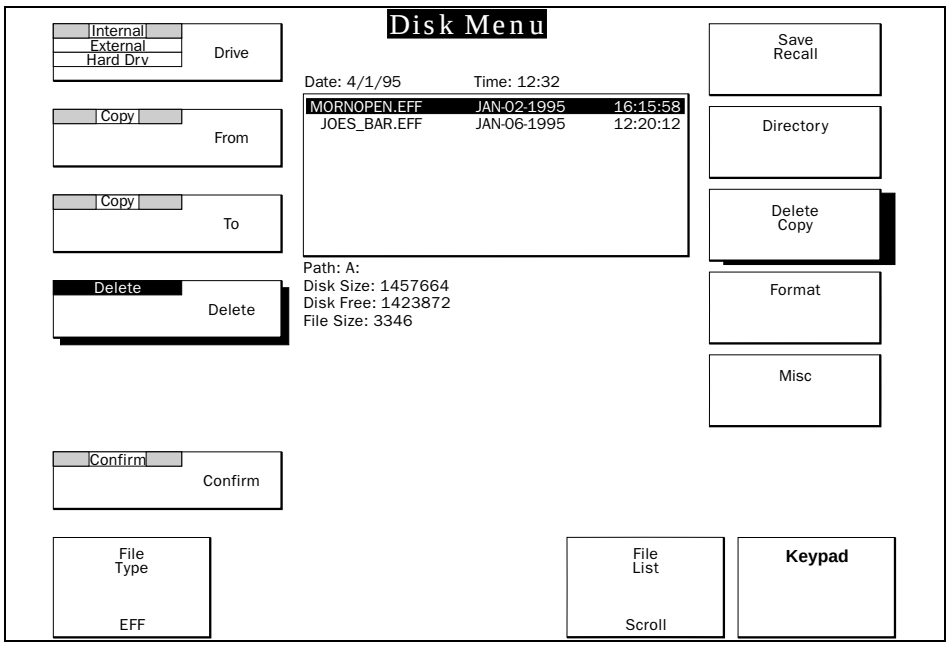


Figure 5-18 The Delete Copy Submenu

Delete

Press this softkey to access the **File Type** and **File List** pushknobs, which let you select a file to delete. See the tutorial earlier in this section for a step-by-step procedure.

Confirm

Press this softkey to execute the current command, in this case, a "copy file" or "delete file" command.

WARNING: The 8150 does not prompt you to confirm a deletion, and deleting a file is not reversible with the 8150. However, a PC with the "undelete" utility can restore deleted files if you have not overwritten them. Make sure that the correct file is highlighted before pressing the *Confirm* softkey.

Format Submenu

Press the ***Format*** softkey to format a 720KB or 1.44MB floppy disk with the 8150 floppy disk drive, or to format the optional 1GB SCSI hard disk drive. The 8150 automatically senses the floppy disk density (DD = 720KB, HD = 1.44MB) and formats it accordingly. You cannot format a 1.44MB disk as a 720KB disk.

Drive

This softkey serves the same function as in the Save Recall submenu.

Format

This softkey is highlighted whenever the Format submenu is active.

Confirm

Press this softkey to execute the format command. The prompt "are you SURE you want to do this" appears as a last chance to change your mind before formatting. To continue, press the ***Confirm*** softkey again. To exit without formatting, press any other button.

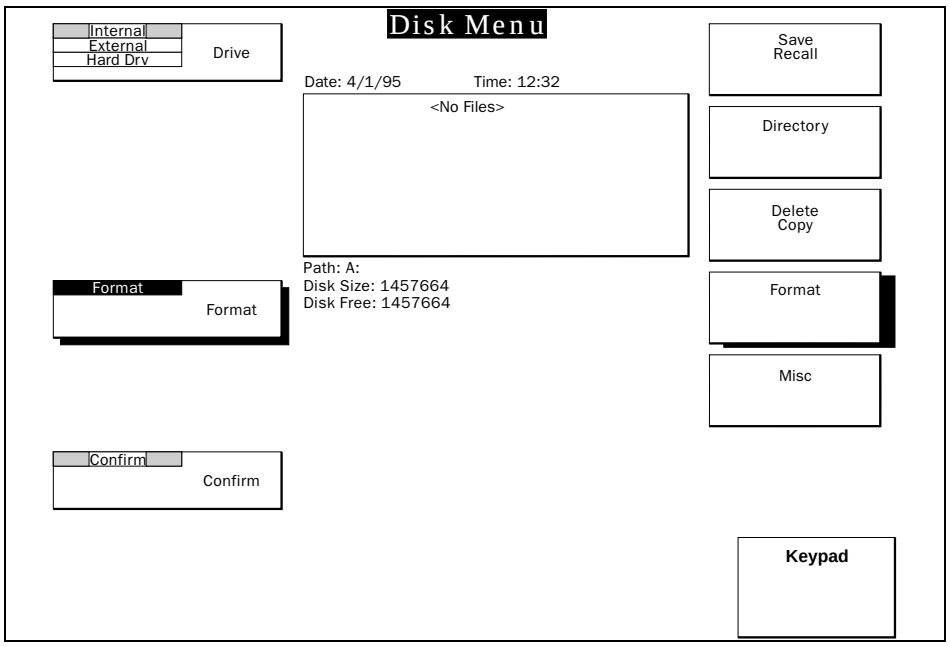


Figure 5-19 The Format Submenu

Miscellaneous Submenu

Use the ***Misc*** softkey to set the time and date for the 8150's real-time clock, which the 8150 uses to time/date "stamp" all files saved on the disk.

Date

Press this softkey to enter the current date. Use the **Month**, **Day**, and **Year** pushknobs to set the real-time clock to today's date. The entered values are not set until you press the ***Date & Time*** softkey.

Time

Press this softkey to enter the current time. Use the **Hour (00-23)** and **Minute** pushknobs to adjust the time. The **Hour** pushknob uses a 24-hour clock: 00:00 is midnight, 06:00 is 6 AM, 12:00 is noon, and 18:00 is 6 PM. The entered values are not set until you press the ***Date & Time*** softkey.

Date & Time

Press this softkey to set the system clock to the date and time as set with the ***Date*** and ***Time*** softkeys. The entered values are not set until you press the ***Date & Time*** softkey.

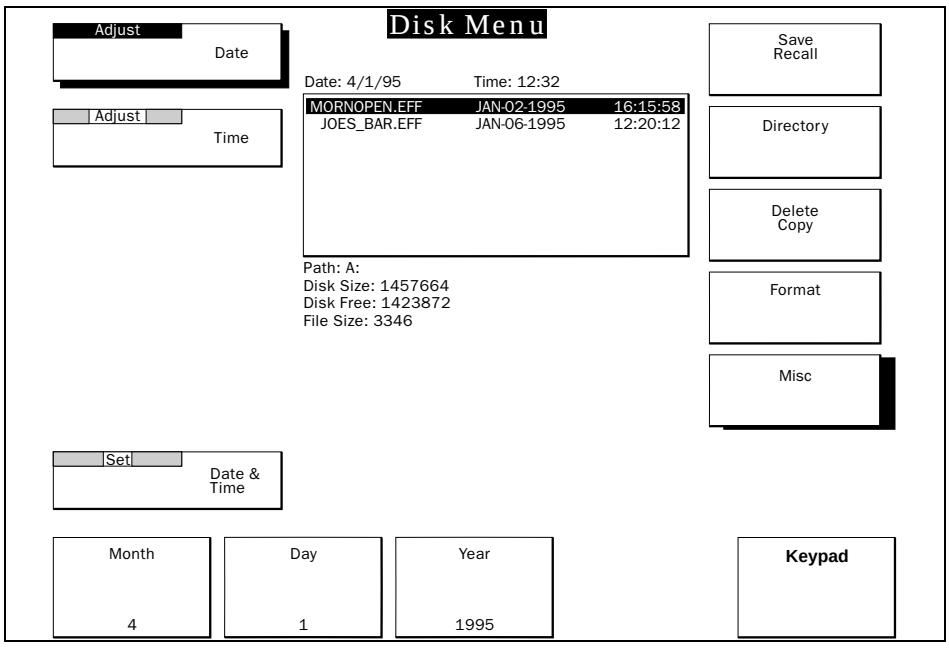


Figure 5-20 The Miscellaneous Submenu

Assembly Removal /Replacement

This section discusses the procedures for removing and replacing the power supply and backup battery in case of failure, as well as the procedure for disassembling the Control Panel.

Power Supply Assembly Removal/Replacement

The 8150 uses a Todd NMX-504-1205V 500 Watt four output power supply. The Signal Chassis power supply mounting tray is designed for relatively quick removal and replacement without having to remove the chassis from the rack. However, if you want to remove the chassis top, you must remove the unit from the rack. Follow these steps to remove and re-install the power supply.

The tools you need include the Accom supplied board inserter/extractor tool, a Phillips screwdriver, and a standard flat blade screwdriver.

WARNING: This procedure involves removing the Switcher board from the chassis, which clears the battery backed memory. Be sure to save all needed Engineering, Personality, Effects, and User files to a floppy disk before beginning this procedure.

STEP 1: Remove the front panel from the Signal Chassis by grasping the lower left and right sides and pulling slightly up and toward you. Power the Signal Chassis off and remove the power cord.

STEP 2: Insert the board insertion/extraction tool over the stud at the front right edge of the Switcher board. Lever the board out with the tool and set the board aside on a clean, static-free surface.

STEP 3: Look into the chassis (you may need a work light) and locate the 16-way (J17) and 12-way (J16) power harnesses connected to the Motherboard. Squeeze the locking mechanisms on the connectors and pull them away from the Motherboard.

STEP 4: Unplug the two way Power Fail cable from Motherboard connector J20.

STEP 5: Disconnect the 3-way AC harness on the right hand side of the power supply from the AC input harness at the rear of the chassis.

STEP 6: Remove the two M4 flat head screws that secure the power supply tray to the front of the chassis.

STEP 7: Two rear facing tabs on the bottom of the chassis locate and secure the rear of the power supply tray. Push the power supply tray back into the chassis slightly to clear these tabs, and lift the rear of the tray straight up, over the tabs, and out the front of the chassis.

STEP 8: To remove the power supply from its tray, loosen the lugs at the rear of the power supply and remove the DC harnesses. The harness wires are color coded as follows:

Power Supply DC Terminals	Wire Color and Size
CH 1 + (+5VDC)	Red (6 awg)
CH 1 – (+5VDC return)	Black (6 awg)
CH 2 + (+12VDC)	Orange (18 awg)
CH 2 – (+12VDC return)	Orange/black (18 awg)
CH 3 + (–12VDC return)	White/black (18 awg)
CH 3 – (–12VDC)	White (18 awg)
CH 4 + (–5.2VDC return)	Violet/black (16 awg)
CH 4 – (–5.2VDC)	Violet (16 awg)

STEP 9: Remove the four flat head screws that secure the power supply to the tray. Slide the power supply away from the front of the tray, loosen the lugs at the front of the power supply, and remove the AC harness. The harness wires are color-coded as follows:

Power Supply AC Terminals	Wire Color and Size
L (AC live)	Brown/black (14 awg)
N (AC neutral)	Blue/black (14 awg)
G (AC ground)	Green/yellow (14 awg)

STEP 10: Remove the two-way Power Fail cable from this power supply and plug it into the replacement power supply. Make sure this cable is seated firmly in the replacement supply. If the Power Fail signal is not connected properly, the battery backup function does not work, and it clears the Switcher board RAM every time the Signal Chassis is reset or power-cycled.

STEP 11: The power supply is normally aligned at the factory and should not require further adjustment. However, if you want to adjust the replacement supply, you must do it at this point, before installing it in the chassis. See the discussion at the end of this installation procedure for more information.

STEP 12: Reconnect the AC harness wires according to the chart on the previous page.

STEP 13: Install the replacement power supply to the mounting tray, securing it with the four 6-32 x 5/16" flat head screws. Reconnect the DC harness wires according to the chart on the previous page. The assembly is now ready for reinstallation.

STEP 14: Guide the power supply tray far enough into the chassis so that it clears the rear locating tabs. Set it down on the bottom of the chassis and pull it forward so that it is located under the rear tabs and flush with the front of the chassis. Install the two M4 flat head screws to secure the power supply tray to the chassis front.

STEP 15: Reconnect the two power harnesses and the Power Fail cable to the Motherboard. The 12-way connector mates with J16, the 16-way connector mates with J17, and the two-way connector mates with J20.

WARNING: The Motherboard has male mating connectors for the circuit board assemblies. Though the connectors are designed to prevent insertion if the Circuit Board connectors are not properly aligned with the Motherboard connectors, use caution when inserting board assemblies into the chassis. They should not require a great deal of force, and should slide smoothly into place.

STEP 16: Reinstall the Switcher board into the chassis. Use the inserter/extractor tool to seat the circuit board connectors completely into the Motherboard connectors.

STEP 17: Power up the 8150 Signal Chassis and replace the front panel. The unit is now ready for use.

Power Supply Output Voltage Adjustment

It is probably not necessary, but you can adjust the power supply's output voltages as follows. Perform this adjustment when the power supply is outside the Signal Chassis.

This procedure requires a digital volt-ohm meter, an insulated screwdriver or alignment tool, a method to connect AC mains power to the AC input terminals, and a user supplied low resistance load to connect across the +/-12V outputs for use in bringing the power supply into regulation.

STEP 1: The main +5VDC output and the -5.2VDC output do not require a minimum load for proper regulation. However, the +/-12VDC outputs require a 20 percent minimum load to regulate properly. Since those outputs are rated at 10 Amps, a 20 percent load draws 2 Amps. If you need to adjust the +/-12VDC outputs, you must connect a 6 ohm (maximum) 25 W (minimum) power resistor across the +12VDC output.

STEP 2: Connect a standard AC mains power source to the AC input terminals on the power supply. See step 9 in the Power Supply Assembly Removal /Replacement procedure for AC terminal connections. This supply is auto ranging, and accepts any voltage from 90VAC to 264VAC, 47Hz to 63Hz.

STEP 3: There are three multi-turn potentiometers in the supply at the DC output end. The potentiometer nearest the +5VDC output terminals (R111) adjusts the +5VDC output. Measure this output with a DVM and set it for +5.1VDC.

STEP 4: The potentiometer in the center (R56) adjusts the +12VDC output, and the -12VDC output tracks it. Measure this output with a DVM across connector J1 pin 5 or 10 (+12) and J1 pin 4 or 9 (+12 return) and set it for 12VDC. (J1 pins 3 and 8 are the -12 output.)

STEP 5: The potentiometer on the left end (R72) adjusts the -5.2VDC output. Measure this output with a DVM across connector J1 pin 1 or 6 (-5.2) and J1 pin 2 or 7 (-5.2 return) and set it for -5.2VDC.

STEP 6: Remove AC mains from the power supply. Remove the load resistor (if installed) and follow the previous installation procedure beginning with step 12.

Backup Battery Removal/Replacement

The 8150 uses a sealed 6V lead-acid battery to power and refresh the on-board 8MB DRAM when the 8150 is not powered. Because of its size, the backup battery is located on the floor of the chassis, not on the Switcher board. Change the backup battery, if needed, as follows. You can usually do this without removing the chassis from the rack.

You need these tools: the Accom supplied board inserter/extractor tool, an ohm meter, and a 5.5mm nut driver.

WARNING: This procedure involves removing the Switcher board from the chassis, which clears the battery backed memory. Be sure to save all needed Engineering, Personality, Effects, and User files to a floppy disk before beginning this procedure.

STEP 1: Remove the front panel from the Signal Chassis by grasping the lower left and right sides and pulling slightly up and toward you. Power the Signal Chassis off and remove the power cord.

STEP 2: Insert the board insertion/extraction tool over the stud at the front right edge of the Switcher board. Lever the board out with the tool and set the board aside on a clean, static-free surface.

STEP 3: Remove the four M3 nuts that hold the battery bracket to the floor of the chassis. (You may have to hold the power harness out of the way while loosening the right-side nuts.) Lift the bracket up to clear the mounting studs and remove it from the chassis.

STEP 4: Disconnect the battery harness from Motherboard connector J18 and remove the battery from the chassis.

STEP 5: Remove the wiring harness from this battery and install it on the replacement battery. You may want to check for continuity of the red lead, as it has a fuse. If there is no continuity, replace the fuse with a 3.5 amp in-line fuse (Accom P/N 2000-0023). Connect the black wire (gnd) to the black battery terminal and the red wire (+6V) to the red battery terminal.

STEP 6: Set the replacement battery in the chassis (terminals toward the left side of the chassis) and connect the battery harness to Motherboard connector J18.

STEP 7: Reinstall the battery bracket, securing it with the four M3 nuts. Again, you may need to hold the power harness out of the way to tighten the right-hand nuts.

STEP 8: Reinstall the Switcher board into the chassis. Use the inserter/extractor tool to seat the circuit board connectors completely into the Motherboard connectors.

STEP 9: Power up the Signal Chassis. To test the replacement battery and related control circuit, recall an Engineering, Personality, Effect, or User file from a floppy disk into memory. (See the Disk menu description earlier in this section for more information.) Power cycle the Signal Chassis and verify that the file(s) just recalled are still present in memory. If so, the unit is ready for use.

Control Panel Disassembly and Assembly

The 8150 Control Panel requires little or no access to its internal sub assemblies over the course of normal operations and/or maintenance. However, if you need to get inside the Control Panel for any reason, follow this a step-by-step procedure.

The only tool that you need is a Phillips screwdriver, magnetic if possible. You may also want to have a small piece of cloth or plastic available to place between the Control Panel sections to avoid scratching the paint, as described in step 4.

Separating the Control Panel Top and Bottom

STEP 1: Disconnect any external cables from the Control Panel, including: the Chassis communications cable, the DC power cable, the PC keyboard cable (if installed), the mouse cable (if installed), and the external floppy disk drive cable (if installed).

STEP 2: Place a piece of cloth or other protective covering over the workbench area to avoid scratching the paint on the Control Panel. Place the Control Panel face down on this protective covering.

STEP 3: There are 10 flat head screws that secure the top of the Control Panel to the bottom. Loosen these screws and remove them with the magnetic screwdriver.

> **NOTE: If you do not have a magnetic screwdriver, the screws will fall out when you invert the Control Panel in the next step. Make sure that you do not lose these screws!**

STEP 4: Hold the top and bottom sections of the Control Panel together, and turn it over so that it is face up. First, gently lift the left side of the panel top, tilting it slightly. (This tilt is necessary to clear the floppy disk drive on the right side of the Control Panel top.) Continue to lift the left side while also lifting the right side. Internal cables prevent you from lifting the top piece completely off. You may want to place a small piece of cloth or plastic at the bottom edge between the two panel sections while disconnecting the cables in the next step.

STEP 5: Tilt the top edge of the Control Panel LCD panel toward you, letting the bottom edge rest on the bottom edge of the Control Panel. Inside the Control Panel, there are four cables that you must disconnect from the CPU assembly if you want to completely separate the two Control Panel sections. These cables are:

DC Power (J7), in the lower right portion of the board
Floppy Disk (J3), at the right edge of the board
LCD Data (P6), in the upper right portion of the board
CPU Data/Address (J4), at the center lower edge of the board

STEP 6: After disconnecting the above cables from the CPU board, lift the Control Panel top piece completely off and set it aside.

Reassembling the Control Panel Top and Bottom

STEP 1: You may want to place a piece of cloth or plastic along lower edge of the Control Panel bottom to avoid scratching the paint. Place the Control Panel top on top of the bottom, tilting the LCD panel up toward you.

STEP 2: Reconnect the four cables to the CPU board:

DC Power (J7), in the lower right portion of the board
Floppy Disk (J3), at the right edge of the board
LCD Data (P6), in the upper right portion of the board
CPU Data/Address (J4), at the center lower edge of the board

STEP 3: Lift and hold the Control Panel top piece above the bottom piece and tilt the right side down slightly. Lower the top piece so that the floppy disk drive fits into its cutout in the bottom piece. Continue lowering the top piece until it fits into place on the bottom piece.

STEP 4: Hold the two pieces together, and turn the Control Panel face down on the cloth or plastic. Reinstall the 10 flat head screws in the Control Panel bottom.

STEP 5: Invert the Control Panel so that it faces up. You may now reconnect it to the 8150 Signal Chassis. Make sure the following cables are reconnected:

The Chassis communications cable
The DC power cable
The PC keyboard cable (if installed)
The mouse cable (if installed)
The external floppy disk drive cable (if installed)

STEP 6: When you power up the Control Panel, it takes about eight seconds to boot up. If it is connected to an operating Signal Chassis, the menu that was current when the Control Panel was disconnected should appear in the LCD menu display.

The Hangman game appears to indicate that the Control Panel is running but not communicating with the Signal Chassis. Verify that the Signal Chassis is powered up and the control cable is connected at both ends.

If the menu does not appear at all, check to make sure that the LCD brightness and contrast controls (thumbwheels on the left edge of the Control Panel) are set correctly for proper viewing, as you may have disturbed these settings during assembly/disassembly.

"Preread" and the 8150

Some digital VTRs offer a "preread" or "read before write" feature. This function takes advantage of the fact that, in a digital VTR, the "stunt motion" playback heads are physically ahead of the erase and record heads for each video track.

In normal Play mode, the stunt motion playback heads are used as the playback heads. In Record or Insert Edit modes, they actually play back the video and audio data on the tape (the so-called "preread") before it is erased and modified video and/or audio is recorded in its place. The playback heads are typically located at points on the scanner as far in advance of their corresponding erase heads as possible. Since the scanner is rotating at a known speed, there is a certain predictable amount of time between when the playback heads are in contact with a certain point on the tape, and when the record heads are in contact with the same point on the tape. It is this time interval that lets preread work by routing the preread video out of the VTR to another processing device (in this case, the 8150), and back into the VTR before the record heads get to the point on the tape where the video originally came from.

The preread video from the VTR can now be combined with a new video signal (usually by keying the new video over the off-tape signal), or otherwise processed, and sent back to the VTR input. If the processing time outside the VTR is within the time interval between the playback heads and the record heads, minus processing time inside the VTR, the modified video can be re-recorded in the same location on the tape. In the case of the Digital Betacam®, this time interval is approximately 40 TV lines in the 525-line standard. Since the maximum delay through the 8150 is 34 lines, the 8150 can be used to process the off-tape video in Preread mode.

Of course, when you perform a Preread edit, you erase and overwrite the original (unmodified) video so that it no longer exists on that tape. You must process the off-tape video correctly the first time – there are no second chances. For this reason, it would be good practice to make a digital protection "clone" or "dub" of the master tape before editing it in Preread mode.

The 8150 needs no special setup to work with the Preread feature. Connect the 8150 and the digital VTR to the same reference; connect the 8150 Program output or one of the Aux outputs to the VTR digital video input; and connect the VTR digital video output to one of the 8150 digital inputs.

VTR Setups for Insert and Preread Editing

This discussion covers the settings needed on certain digital VTRs for proper viewing of editor controlled Insert and Preread edits.

Digital Betacam VTR Settings

If you are using a Digital Betacam format VTR, for normal insert editing or for Preread editing, configure the reference settings for the VTR as follows. This procedure assumes that the VTR has SYS1 and SYS2 software version 4.00 or above installed.

STEP 1: On the VTR, make sure that DIP switch S100 on the SS board has segments 1 and 5 turned on. This lets you access the needed setup menus.

STEP 2: Pull out the VTR front Control Panel section. Set the OUT REF switch to REF.

STEP 3: Connect the VTR's VIDEO OUTPUT COMPOSITE 3 to an analog monitor, or connect SERIAL V/A OUTPUT 4 to a serial digital monitor. Make sure the CHARACTER switch on the system setup panel is ON.

STEP 4: Press the **MENU** button to display the Setup menu on either of the above outputs. Make sure the search dial is in JOG mode (no click stops when you turn it). If not, press it once.

STEP 5: Turn the search dial to get to the System Menus and set the following parameters:

Menu Item	Parameter	Correct Setting
105	Ref Alarm	Off
309	Servo Ref	Ext
316	Confi Mode	Mode 2
706	V Blk Shift	On
727	V Ed Sw'er	Ext
810	A Ed Sw'er	Ext

STEP 6: To load these settings and exit the Setup menus, press the **SET** button. The Setup menu disappears and the changes you made are saved.

STEP 7: For normal insert editing, toggle the **CONFIDENCE ON/OFF** button on the front control panel to light the LED, and toggle the **PB.EE PB** button to light the **PB** LED. This forces the VTR to output off-tape video in all modes except Standby Off. For Preread editing, press the **PREREAD ON/OFF** button to light the LED. This places the VTR output in PB mode and forces it to lock to external reference at all times.

The Digital Betacam VTR is now ready for both normal and Preread editing.

D5 VTR Settings

If you are using a D5 format VTR, for normal insert editing or for Preread editing, configure the reference settings for the VTR as follows.

STEP 1: On the front panel of the VTR, press the **VIDEO OUT** menu button (keypad button 8). Press the **F8** softkey (SETUP), and toggle **F7** (V SYNC) to REF. This locks the VTR output to external reference in all modes.

STEP 2: Press the **F12** softkey (STATE). This brings up a matrix that shows the VIDEO, D. AUDIO, and CUE output modes of the VTR in different states (STBY OFF, STBY ON, REC, EDIT REC, etc.). Use the CURSOR controls (four arrow buttons around a center button) to set the VIDEO states of STBY ON and EDIT REC to TAPE (see the VTR Operations Manual for more information on using the CURSOR controls). This forces the VTR to output off-tape video in all modes except Standby Off. This results in a properly framed output at all times, including while in Edit Preview and Edit Record mode. Set all other states according to your preference.

STEP 3: The VTR is now configured for both normal insert editing and Preread editing. To enable Preread mode, press the **HOME** button. Press and hold the **F** button and press **F11** (PREAD A), **F12** (PREAD V), or both to enable Preread for audio, video, or both. To exit Preread mode, press the appropriate **F11** or **F12** button.

Effects Loop Processing

Conceptual Background Information

While keying, it is often desirable to manipulate the processed key and fill signals in a DVE or other device before combining them with the background. Traditionally, this involved performing the key on one keyer, sending the processed key and fill out two Aux outputs to the DVE, manipulating the processed key and fill, and re-entering them to the switcher. Another keyer must be used here to perform the actual layering over the background. This process uses two keyers to create one key, which can be a significant sacrifice of resources.

The power of the 8150 Effects Loop feature is that it can divert the processed key and fill from the keyer before it is layered over the background, send it out two Aux outputs to either the internal DVE if installed, or an external DVE, where it is manipulated, then re-entered as before. However, instead of using another keyer to perform the layering, you use the same keyer from which the processed key and fill were originally routed. This process uses only one keyer to create one key, leaving the other keyers available for more layers.

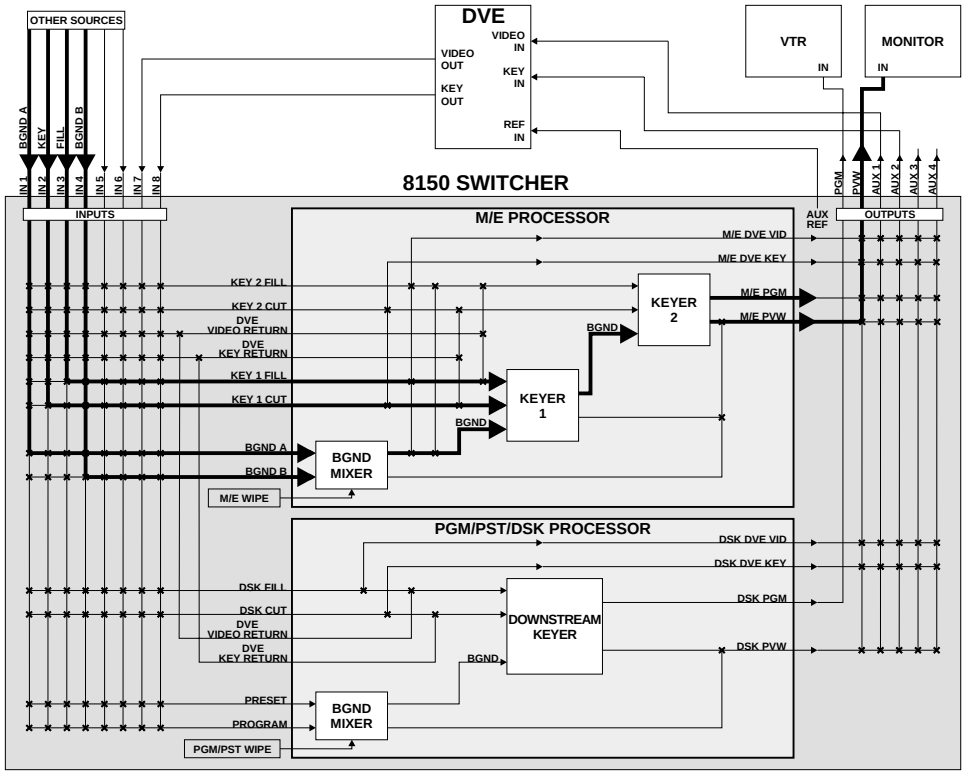


Figure 5-21 Effects Looping Off

There are two types of 8150 Effects Loops. The first sends the processed key and fill of Keyer 1, Keyer 2, or the DSK to the DVE, and returns it to the same keyer.

The second type lets you perform an M/E Background A/Background B transition (mix, wipe, or NAM), composite Keyer 1 over this mix, and send the entire composite out to the DVE for manipulation. The Background A/B /Keyer 1 composite, now "inside" the DVE, is re-entered into the M/E and keyed over another background using Keyer 2. The question here is how to select the "new" background video, since the Background A and B buses are already being used to create the transition fed to the DVE.

The answer: in this mode the DVE is forced as the Keyer 2 fill and key source, so the Keyer 2 bus row is now free. This lets you use it to select the "new" background video over which the DVE, and the Background A/B/Keyer 1 composite, is keyed. The DSK is still available for another independent key over all of the above.

In a traditional switcher, duplicating this effect requires using an entire M/E to perform the transition, sending it to the DVE, and keying the re-entry in another M/E. This uses two M/Es to generate one key.

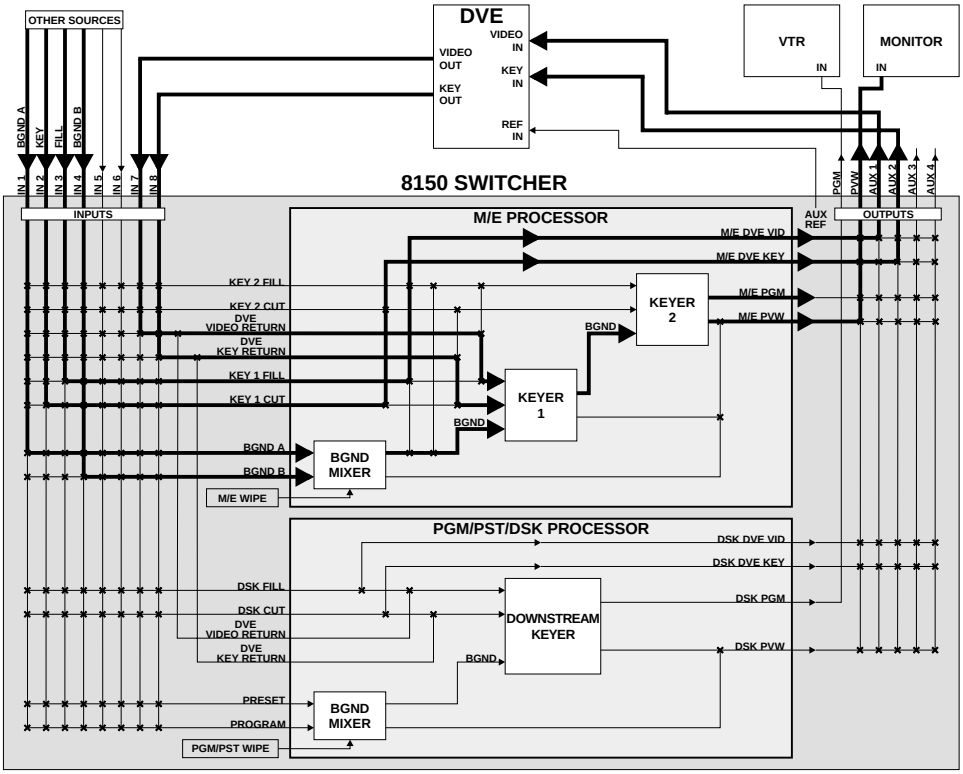


Figure 5-22 M/E Key Effects Loop

NOTE: Since the M/E processor and the PGM/PST/DSK processor share the Effects Loop return path, you can enable only one Effects Loop at a time. However, if you have four Aux outputs installed, you can use them to feed two different DVEs to create different Effects Loops, as long as they are not used simultaneously. Alternatively, if the internal DVE option is installed, you can use it for one Effects Loop and an external DVE for another Effects Loop, again provided that they are not attempted simultaneously.

Effects Loop Re-Entry Timing

You must reference an external DVE, or any device fed by an Aux output to perform effects looping, to the Aux Ref output associated with those Aux outputs. The issue now is how the 8150 deals with the DVE re-entry after it has been delayed by the 18 or 34 lines of processing time, since the 8150 input timing window range is only one half line advanced to two lines delayed from reference.

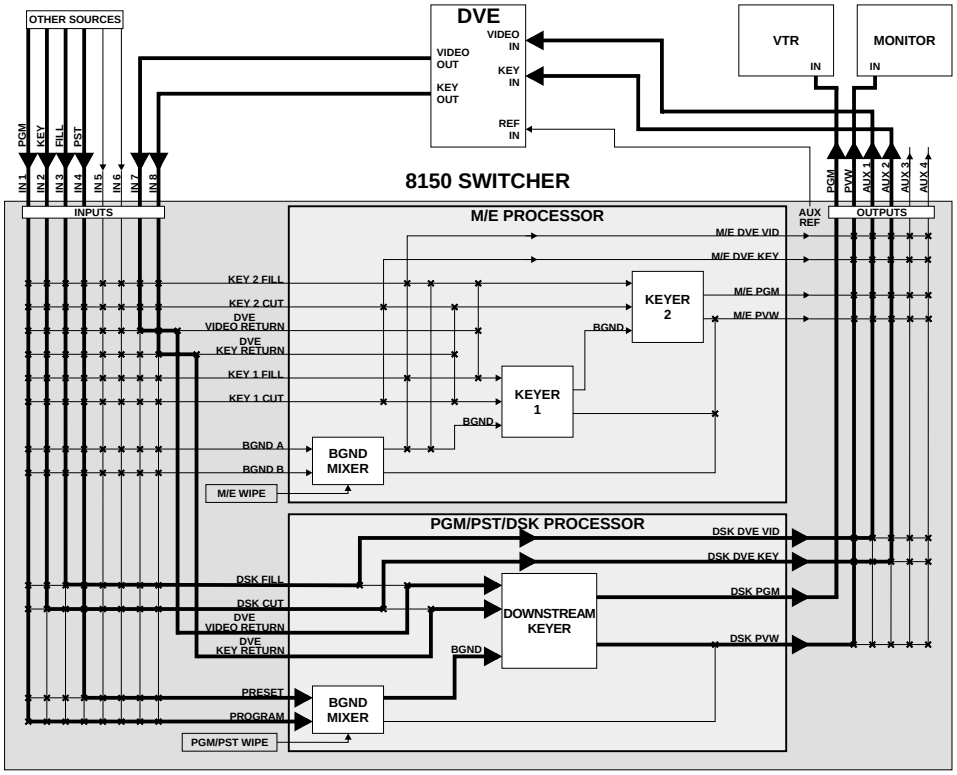


Figure 5-23 Downstream Key Effects Loop

The Engineering menu Input submenu ***Effects Loop Inputs*** softkey has two pushknobs that select DVE video and key inputs. Note that there are independent settings for ***DVE 1*** and ***DVE 2***, to support two pairs of Aux outputs as described above. Entering the input numbers for the DVE(s) here tells the 8150 that, when it is performing an Effects Loop, the re-entry video and key from the DVE is returning at the selected inputs. The 8150 then compensates for these delayed sources by delaying its automatic input timing window by the same amount for just those two inputs. It then routes these two inputs back to the same points in the M/E Processor or PGM/PST/DSK Processor from which the original signals left.

If you are using two DVEs, you may also be using a video combiner to composite the outputs of the two DVEs together before re-entry to the 8150. If this is so, the two DVEs must be locked to the same reference. However, if DVE 1 is locked to the 8150's main Aux Ref output, and DVE 2 is locked to the Aux Ref 2 output, they may not be cotimed to each other. This is why the **Combiner** pushknob appears in this submenu. **Combiner Off** is the default mode; it lets the timing of Aux 1 and 2 outputs be different from that of the Aux 3 and 4 outputs. **Combiner On** forces all Aux outputs to match the delay of those Aux outputs, and therefore the Aux Ref outputs, used in the current Effects Loop. Note also that if you are using a video combiner with two DVEs, one pair of

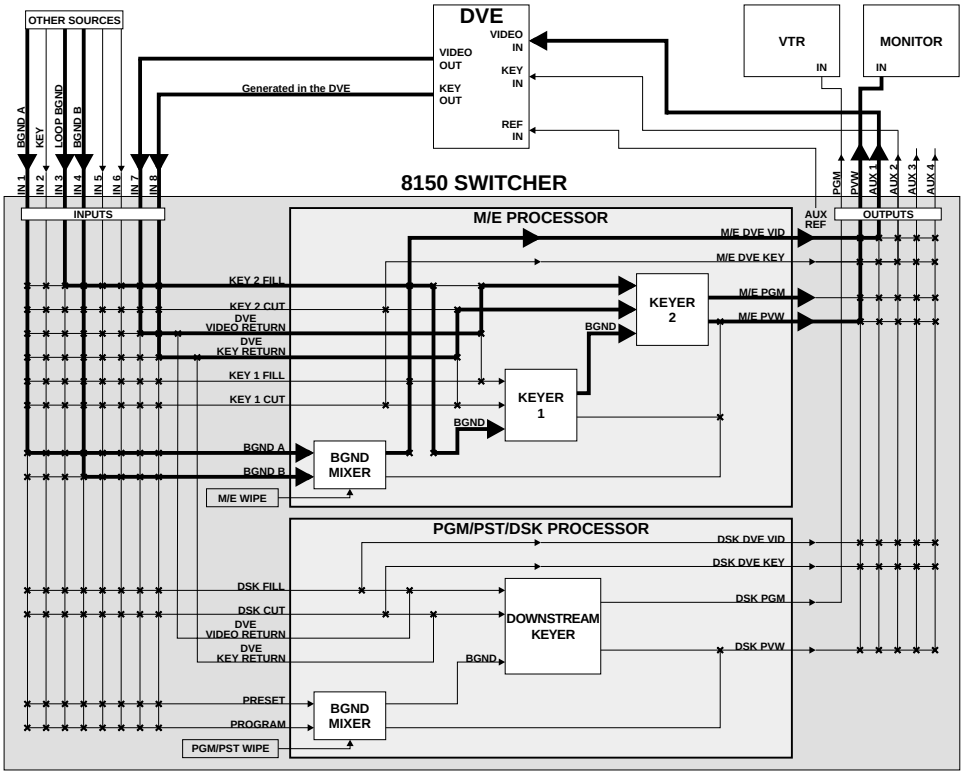


Figure 5-24 M/E Background Effects Loop

DVE Effects Loop Inputs must be the video and key outputs of the video combiner, and the other pair of DVE Effects Loop Inputs must remain set to 0.

In any Effects Loop mode, the DVE video and key re-entries are not correctly timed for use as direct sources in the 8150. They are timed properly only for the processor (M/E or PGM/PST/DSK) from which they are currently being fed.

Connect and set up effects looping as follows.

STEP 1: For effects looping purposes, the Aux outputs and external DVE inputs must be connected as follows if using Aux 1 and 2:
Aux 1 to DVE 1 Video input
Aux 2 to DVE 1 Key input

If you are using a second DVE or using the Aux 3 and 4 outputs to feed a single external DVE:
Aux 3 to DVE 2 Video input
Aux 4 to DVE 2 Key Input

STEP 2: Connect the main Aux Ref output to the DVE 1 reference input. If you are using two DVEs, connect the Aux Ref 2 output (from the Aux 3 and 4 option module) to the DVE 2 reference input. If the DVE(s) need to also have house reference because they are shared with other devices or suites, you may need a reference patching or switching arrangement. This is because the DVE is delayed by two lines, 18 lines, or 34 lines from house reference when Aux Ref or Aux Ref 2 is the DVE reference.

STEP 3: Press the ***Input*** softkey in the Engineering menu. Press the ***Effects Loop Inputs*** softkey and highlight ***DVE 1***. (The ***DVE 2*** selection is used only with the optional Aux 3 and 4 outputs described later.)

STEP 4: Using the **DVE Video Input** and **DVE Key Input** pushknobs, select the physical input numbers (not the crosspoint numbers) to which the DVE video and key outputs are connected.

NOTE: Because the input timing window for an entire Input module is changed, the DVE video and key inputs must be connected to the same Input module for effects looping to work properly.

STEP 5: This completes the connection and setup for a single external DVE (for two external DVEs, see step 12). To check for proper operation, set up a key on M/E Keyer 1. See Section 4 – Keying, in the 8150 Operations Manual, for information on setting up a key.

STEP 6: After setting up the key, bring up the Aux Buses submenu in the Miscellaneous menu. Press the ***Effects Loop Inputs*** softkey, then turn the **DVE Select** pushknob to select **EXT 1**. (To use the internal DVE, if installed, you can select **Internal** to use that DVE.)

STEP 7: Use the **Loop Select** pushknob to select **M/E Key 1**, then press the **Press to Assign** pushknob to activate the loop. (The **Press to Assign** display reads **DVE 1 – M/E Key 1** to indicate that a loop is active; if you are using the internal DVE, the display reads **DVE I – M/E Key 1**.) The processed fill and key signals from Keyer 1 are now routed via the DVE to the keyer. (Make sure that the DVE key channel is turned on.) You can now reposition and otherwise transform the key over the background, and still have the other two keyers available. You can perform an Effects Loop for any of the three keyers, one at a time, by performing a key on Keyer 1, Keyer 2, or the DSK, and selecting **M/E Key 1**, **M/E Key 2**, or **DSK** (respectively) with the **Loop Select** pushknob, followed by pressing the **Press to Assign** pushknob to activate the loop.

STEP 8: Set **Loop Select** back to **Off** and press **Press to Assign**, changing its display **to DVE Loop Off.** Turn KEY 1 on and select a background for it on the Background A bus.

STEP 9: Select **M/E Bgnd** with the **Loop Select** pushknob and press **Press to Assign**. (Make sure the DVE key channel is turned off.) Press the **BGND** transition select button and perform a partial transition of Background A and B. The transition, with Keyer 1 composited over it, should appear "inside" the DVE. The DVE is visible because it is returning via Keyer 2, which is forced on; you cannot turn Keyer 2 off in this mode. If you "squeeze" the DVE image size down, you can see it keyed over

the background video, which you can select on the Keyer 2 Fill bus row.

STEP 10: To change the background video, select a different source on the Keyer 2 Fill bus. To change the video "inside" the DVE, select a different source on the Background A bus, or move the fader bar to transition to the Background B source. Note that the DSK is still available for use.

STEP 11: If the Aux 3 and 4 option is installed in the 8150, you can use these outputs to feed another DVE, called ***EXT 2*** in the ***Effects Loop Inputs*** softkeys in the Miscellaneous Aux Buses submenu.

STEP 12: You can set up and check a second DVE for effects looping by toggling the ***Effects Loop Inputs*** selection to ***DVE 2*** and repeating steps 1 through 10. If the two DVEs feed a video combiner before re-entry to the 8150, set the ***DVE 1*** inputs to correspond to the video combiner output connections, and leave the ***DVE 2*** settings at 0.

Encoding the 8150 Output (NTSC)

The 8150 processes only component video, so does not provide composite outputs. If you are operating in the 525-line standard and need a composite output, you can use the Accom A28 Digital Encoder to output composite digital and analog video for monitoring, recording, etc.

Encoding the 8150 output in 625-line environments is outside the scope of this manual. However, as a general rule, if you are operating in the 625-line standard and need a composite output, you must provide a suitable encoder. If the encoder requires an external black burst reference, you must cotime this reference to the 8150 output (i.e., delayed by 34 lines from the reference to the 8150). One way to do this is to convert the 8150 output to a component analog signal and use the sync portion of this signal to genlock a dedicated black burst generator, which can then provide a suitable composite reference for the encoder.

8150 to A28 Connections

The Accom A28 Digital Encoder requires a composite reference to provide a properly encoded output. The A28 processes this reference with one of three option modules: Option F (parallel composite digital reference, the standard), Option G (composite analog reference and output), or Option H (serial composite digital reference and output). The A28 with any of these three options provides a parallel composite digital output, but Option G gives you two features that the others do not:

- Two composite analog (NTSC) video outputs. You can adjust the gain, black level, and active picture phase from the front menu display.
- Horizontal phase and subcarrier phase timing controls for all outputs.

It is recommended that the A28 used for this purpose has Option G installed for greatest flexibility. Since the standard A28 has only parallel digital inputs, Option C (the serial component digital input module) is also required, unless you have another way to deserialize the 8150 output before inputting it to the A28

> **NOTE: When connected to the 8150, the output timing delay of the A28 equals that of the 8150. In other words, if the 8150 output is set to 34 line delay, the A28 output has that same delay from reference. If the 8150 output is set to one frame delay, the A28 output is also delayed by one frame from reference.**

If your 8150 does not have the Frame Delay Output module, modify and connect the A28 for use with the 8150 as follows. If you do have the Frame Delay Output module, you can use the A28 without this modification, as long as the 8150 output connected to the A28 is set to one frame delay.

If your A28 was shipped after January 1995, skip steps 1 through 10 and begin with step 11.

STEP 1: Make sure you have the A28 Timing Modification Upgrade Kit (Accom P/N 9300-00-7900) before you begin. This modification lets you delay the A28 output sync and burst to match the delay of the 8150. The modification kit consists of a programmed IC and some rework wire.

STEP 2: If the A28 is installed in a rack, remove all cables from the rear of the unit, labeling them to make it easier to reconnect them when you are finished. If the A28 is not installed in a rack, continue to the next step.

STEP 3: At the front of the A28 chassis, remove the four small screws along the lower edge of the front plate. At the rear of the chassis, remove the four larger screws at the corners of the rear connector panel.

STEP 4: Press on the rotary knobs to slide the bottom chassis tray out the rear of the housing. Set the bottom tray (with the circuit board) on a work surface.

STEP 5: Remove the option module(s) from the Main board by removing the three screws that secure the module(s) to the rear panel.

STEP 6: Loosen the Main board by removing the hex screws from the rear D subconnectors. Slide the board forward and up to remove it from the chassis.

STEP 7: On the solder side of the Main board, connect pin 13 of IC U29E to pin 16 of DIP switch U15Q with the rework wire.

STEP 8: On the component side of the board, remove the IC at location U29E and replace it with the IC from the kit, labeled 457302.

STEP 9: Set DIP switch U15Q position 1 to ON. This delays the A28 output sync and burst to match the 8150 delay; turn the switch OFF if you are feeding a source other than the 8150 to the A28.

STEP 10: Reinstall the Main board and option module(s) into the bottom chassis tray and reinstall the tray into the upper chassis housing.

STEP 11: Make the following connections to the A28.

REF(ERENCE) IN: Connect one of the following reference signals to this input according to the option module installed.
Option F (parallel composite digital reference) must have a parallel D2 signal, locked to the same reference as the 8150, connected to it.
Option G (composite analog output and reference) must have black burst, locked to house reference, connected to it, preferably the same black burst that serves as reference to the 8150. Do not use composite sync or other signals without color burst, as the A28 needs subcarrier reference to generate a properly encoded output.
Option H (serial composite digital output and reference) must have a serial D2 signal, locked to the same reference as the 8150, connected to it.

REF(ERENCE) OUT: This is a passive loop through with the Option G and H modules. Connect it to other equipment or terminate it into 75 ohms. If the Option F module is installed, this is an active loop through, which you do not need to terminate. However, it does not provide a loop through signal if you remove power to the A28.

O/P VA and **O/P VB** (Options G and H only): These are identical composite analog video outputs if Option G is installed, or identical serial composite digital video outputs if Option H is installed. Connect them to any composite device that needs the 8150 output in the appropriate format. With DIP switch U15Q segment 1 turned ON, this output is delayed 34 lines from the reference connected to the A28.

O/P KA and **O/P KB** (Options G and H only): These are identical composite analog key outputs if Option G is installed, or identical serial composite digital key outputs if Option H is installed. Only use these if you are feeding a key signal to the A28 that matches the timing of the 8150 program or preview output. With DIP switch U15Q segment 1 turned ON, this output is delayed 34 lines from the reference connected to the A28.

D1 VID IN: If you have a way to convert the 8150 output from serial digital to parallel digital, connect the deserialized 8150 output to this input.

D1 KEY IN: Use this input only if you are feeding a parallel digital key signal to the A28 that is zero timed to the 8150 program or preview output.

D2 VID OUT: This is the composite digital (D2) video output. Connect this to any composite digital device that uses the 8150 as an input. With DIP switch U15Q segment 1 turned ON, this output is delayed 34 lines from the reference connected to the A28.

D2 KEY OUT: This is the composite digital (D2) key output, which is not active unless you have a digital key input connected. If so, connect this output to any composite digital device that requires the encoded key signal as an input. With DIP switch U15Q segment 1 turned ON, this output is delayed 34 lines from the reference connected to the A28.

If the A28 has Option C (serial component digital input) installed:

I/P VA: Connect an 8150 program output to this input.

I/P VB: If needed, connect the 8150 preview output to this input. You can connect an Aux output to this input, but its timing is incorrect unless the source fed to the Aux output is a source delayed by 34 lines from reference. Note that the A28 encodes only one input video signal at a time.

I/P KA and **I/P KB:** Use these inputs only if you are feeding serial component digital key signals to the A28 that are cotimed to the 8150 program or preview output. Note that the A28 encodes only one input key signal at a time.

STEP 12: Connect power to the A28. Verify that a composite version of the 8150 output is present at all A28 video outputs. If Option G is installed, you can adjust the levels and horizontal timing of the analog outputs in a limited range, if needed, to match you system's levels and horizontal timing.

NOTE: If you use the A28 to encode sources other than the 8150 set to 34 lines of delay, you must set DIP switch U15Q segment 1 OFF. This setting, however, prevents using it to encode the 8150 output with the correct timing, unless the 8150 output is set to one frame delay. See the A28 Technical Manual for more information on this DIP switch and other A28 timing controls.

Section 6

System Timing

General Timing Considerations

Introduction

Using digital processing in a post production switcher lets you implement features that would be difficult, or at least very expensive, with a traditional analog switcher. Because the video is processed digitally, you can use features such as automatic input timing, key and border defocus, wide keyer borders, vertical key sizing and positioning, and high resolution 4:4:4 chroma key extraction and downsampling. This processing, however, does take time. The processing delay for the Preview and Program outputs is a minimum of 34 lines; however, with the optional Frame Delay Output module, which is optional on the 8100 and standard on the 8150, you can select either the 34-line delay (from reference) or a full frame of delay for the Program 1 and Preview outputs so that you can retime them into your system. The Program 2 output delay is fixed at one frame from reference.

There are three timing delays associated with the 8150 Aux bus outputs: two lines from reference, 18 lines from reference, and 34 lines from reference. Additionally, you can select a one frame delay for the Aux 1 and 2 pair only; a detailed discussion of these three delays appears below. Most devices that a typical post production switcher must feed, however, are not affected by these delays. Monitors, as long as they are set to internal sync, simply lock to their input video regardless of its timing relative to the rest of the system. Likewise, routing switchers and other terminal gear usually are not concerned with the relative timing of their input video sources. Most VTRs and digital disk recorders automatically lock to their input video when in Record or Edit mode, and relock to external reference when in playback mode. Also, component digital VTRs with the "preread" or "read before write" feature typically allow up to 40 lines of external processing delay.

Most DVEs do not correctly lock to video more than one to two lines delayed from the DVE reference. For this reason, the 8150 provides a floating reference output associated with each pair of Aux outputs. This floating reference is called Aux(iliary) Ref(erence), and it matches the timing of its associated Aux outputs so that any destination device locks

to any source sent to it via an 8150 Aux output, provided that the destination device is referenced to the 8150 Aux Ref signal.

Video encoders often require a black burst reference to add correct sync, burst, and blanking to the final composite output. The 8150 does not output a black burst signal, but in 525-line environments, the Accom A28 Digital Encoder has a mode that can properly encode the 8150's output for a composite digital (D2) or analog (NTSC) signal.

Setting the outputs to a full frame delay is useful in allowing you to retime the switcher output back into your video system, or for routing the switcher output to a device that locks only to reference, and cannot lock to its own input. Another use is when editing with analog VTRs, whose outputs lock to input video when in E-E or Record mode.

System Locking Reference

The 8150 accepts either NTSC or PAL black burst (nominally 340mV or 300mV p-p into 75 ohms, respectively) or 525/625 composite sync (either 2V or 4V p-p into 75 ohms) as a system locking reference signal. Ensure that the line standard selected in the Engineering Setup menu matches the line standard of the reference signal. The SYNC LED on the Output module lights green when it detects a reference signal at the selected line standard. See Section 5 – Engineering Setup for more information.

Automatic Input Timing

The 8150 can accept sources that are advanced by up to one half line or delayed by up to two lines with regard to reference; this eliminates the need for source timing adjustments. The source, however, must be genlocked to the same reference as the 8150; the automatic input timing does not function as a frame synchronizer or time base corrector. Also, if a DVE or other source is locked to the Aux Ref output, the 8150 can automatically compensate for the timing delay of the returning video.

Propagation (Throughput) Delay

As mentioned above, the processing delay through the 8150 is more significant than with some other component switchers. The delays fall into three main categories. The following applies to the standard 8100 Output module Aux 1 and 2 outputs, the Enhanced (Frame Delay) Output module with the Aux 1 and 2 outputs set to Auto delay, and the Aux 3 and 4 outputs. If an output is set to one frame delay, all sources are delayed by a full frame.

Aux Output Sources Delayed by Two Lines

Any external input is immediately delayed by approximately two lines from its original timing due to the automatic input timing circuitry (-1/2 to + 2 lines from reference). This means that if an external input to the 8150 is routed directly out an Aux output, it is delayed two lines from 8150 reference, no matter what the original timing of the source. Other independently generated internal sources (Black, SuperMatte, and the Framestores, if installed) have this same delay from reference so that a live switch from an external source to an independent internal source, or vice versa, does not cause a timing discontinuity at the output.

Any Aux output with the following sources selected is delayed by two lines from reference, as is the Aux Ref signal associated with that output:

- Any external inputs
- Switcher Black
- SuperMatte generator output
- Optional Framestore 1 and 2 outputs
- Internal DVE video and key output (if fed by one of the above sources)

Aux Output Sources Delayed by 18 Lines

The M/E processing circuitry has a propagation delay of 16 lines. Any external or independent internal source processed by the M/E is delayed by its original two lines, plus the 16 lines through the M/E, for a total of 18 lines delayed from reference.

Any Aux output with the following sources selected is delayed by 18 lines from reference, as is the Aux Ref signal associated with that output:

- M/E Program output
- M/E (look-ahead) Preview output
- Key monitor out (if Keyer 1 or Keyer 2 is the active keyer)
- Wipe pattern output (if M/E wipe is the selected pattern)
- M/E DVE video and key send (used for effects looping)
- Internal DVE video and key output (if fed by one of the above sources)

Outputs Delayed by 34 Lines

Like the M/E, the PGM/PST processing circuitry has a propagation delay of 16 lines. Any external source processed by the PGM/PST block is delayed by its original two lines, plus an additional 16 lines to cotime its input with the M/E output, plus the 16 lines through the PGM/PST processing, for a total of 34 lines delayed from reference.

The Program 1 and Preview outputs are always delayed by 34 lines from reference, no matter what source is selected on them, unless set for one frame delay. Also, any Aux output with the following sources selected is delayed by 34 lines from reference, as is the Aux Ref signal associated with that output:

- DSK Preview output
- Key monitor output (if the DSK is the active keyer)
- Wipe pattern output (if PGM/PST wipe is the selected pattern)
- DSK DVE video and key send (used with effects looping)
- Internal DVE video and key output (if fed by one of the above sources)

> **NOTE: The 8150 main program output is not available directly as an Aux source; however, if Program is selected as the preview output source, then DSK preview is actually main program video.**

Outputs Delayed by One Frame (Some 8100s/all 8150s)

With the Enhanced (Frame Delay) Output module, some outputs can be delayed by one frame from reference. This lets them be retimed into your video system, though with video that is delayed by one frame from the 8150 input.

The Program 1 and Preview outputs on the Frame Delay Output module are switchable between the minimum 34 line delay and a full frame of delay. The Program 2 output, however, contains a fixed one frame delay so that it can be timed to reference to let it re-enter into your video system.

Likewise, the Aux 1 and 2 outputs retain their two line, 18-line, or 34-line automatic delay selections, but add the ability to select a one frame delay so that they can be retimed into your system. Also, if the Aux outputs are delayed one frame, the Aux Ref output becomes effectively zero timed to reference.

The optional Aux 3 and 4 Output module does not support the one frame delay feature; they are effectively in Auto mode all the time.

Auxiliary Reference

The Aux bus output is normally used as a router, feeding video and/or key sources out to a DVE. The DVE then feeds back into the switcher as the video and key source of a linear key. As mentioned above, the minimum delay from reference that an Aux bus output can have is two lines. However, the typical DVE input timing window is usually no more than plus or minus one line with respect to reference (the A57 and DVEOUS are two an exceptions, the A57 having a plus or minus two line window, and the DVEOUS having the identical minus one half to plus two line input timing window as the 8150).

The solution is the Aux Ref signal, which automatically selects one of the three timing offsets: two lines delayed, 18 lines delayed, or 34 lines delayed. The Aux Ref signal from the Output module is vertically timed to Aux bus outputs 1 and 2 (if active); the Aux Ref 2 signal from the Aux 3 and 4 module (if installed) is vertically timed to Aux bus outputs 3 and 4. The example in Figure 6-1 shows a standard Aux bus feed out to an Accom A57, which returns to an 8150 input as a re-entry to the M/E. In this example, the Aux bus and the Aux Ref are delayed two lines with respect to reference. To re-enter the DVE output into the 8150, the DVE must be able to advance its output timing by only about 10.5 microseconds from its reference to fall into the 8150 automatic input timing window. The A57, for example, is capable of advancing its output timing from reference by almost 19 microseconds.

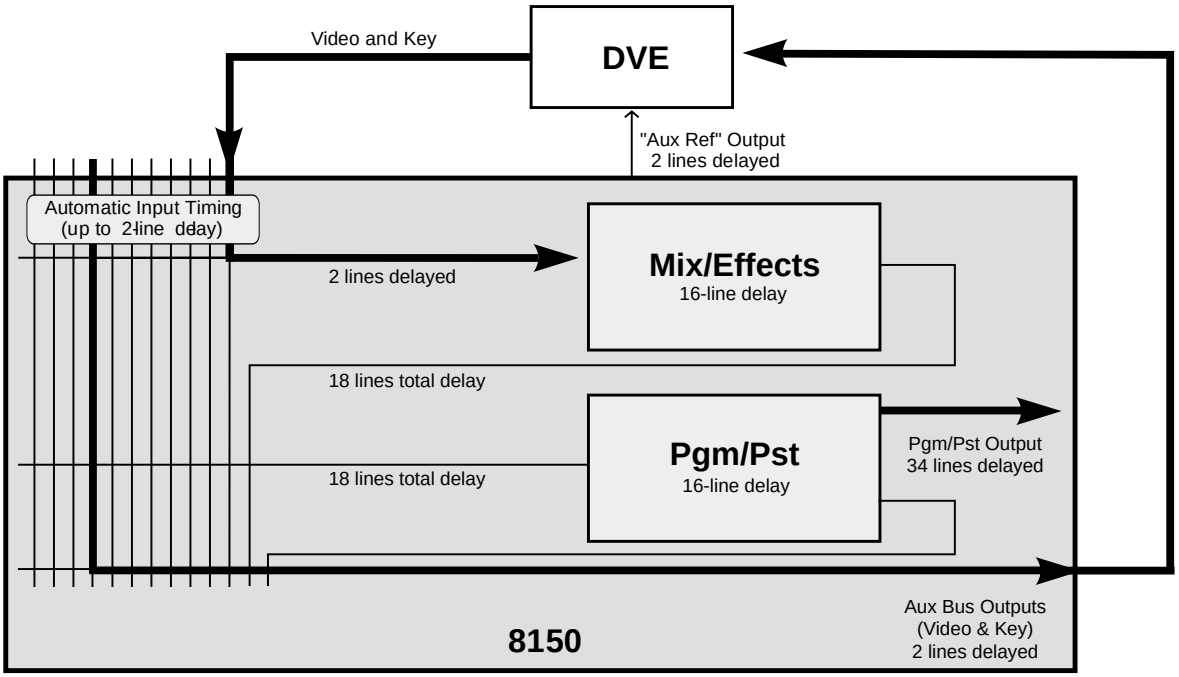


Figure 6-1 Normal Aux Bus Feed to a DVE

If Aux bus outputs 1 and 2 are installed in your 8150, they have one of the three delay values described above, and they are always zero timed to each other. Similarly, if Aux bus outputs 3 and 4 are installed, they have one of the three delays, and are always zero timed to each other, but not necessarily to Aux 1 and 2. This is because most Aux bus applications are for feeding DVE video and key inputs with a pair of Aux outputs, which need to be zero timed to each other. The timing of the analog Aux Ref output associated with each pair of digital Aux outputs always matches the timing of those outputs.

In cases where one Aux output of a pair has a source assigned that contains more inherent delay than the source assigned to the other Aux output of the pair, both Aux outputs are delayed by the larger amount, as is the Aux Ref signal. For example, if Aux 1 has input 4 as a source (with two lines of delay), and Aux 2 has M/E program as a source (with 18 lines of delay), both the Aux outputs and the Aux Ref signal are delayed by 18 lines.

> **NOTE: If you convert the Aux output(s) to analog video via a digital-to-analog converter, the Aux video output timing is delayed from that of the Aux Ref output by the amount of throughput delay inherent in the D-to-A converter.**

Also, if you have Aux bus outputs 3 and 4 installed, they have one of the three delay values described above, as well as being cotimed to each other, but not necessarily to Aux outputs 1 and 2. These additional outputs have their own independent Aux Ref 2 output that serves the same purpose for them as the main Aux Ref output serves for Aux outputs 1 and 2.

Appendix A

8150 Partial Parts List

Part Number	Description	Qty. per system
1000-0009	BAT,6V,PE6V6.5,PORTALAC	1
1500-0028	DISPLAY,14V LAMP, V3250-028	44
1500-0033	DISP,LCD,640x480	1
1600-0060	DISK DR,SONY,3.5"	1
1700-0002	FAN,12V,42CFM,80MM	2
1700-0031	FAN,GUARD,3 1/8" FAN	2
1700-0046	POWER CORD,#C-3120-008BL	2
1700-0047	FAN,12V,A66,60X60X25MM	1
1700-0048	FAN,GUARD,A66,60MM FAN,#08147	2
2500-0063	OEM,8100,PUSH BUTTON ENCODER	4
2800-0054	PSU,360W,MULTI OUTPUT ***(8100 ONLY)***	1
2800-0058	PSU,60W,+5V-6A/+12V-2A,APS	1
2800-0059	PSU,500W,NMX-504-1205 ***(8150 ONLY)***	1
3119-0002	IC,MOD,SIMM,1MEGX32 DRAM,70NS	1
3200-0029	SWI,C&K TP11,PSH BTN,RT/A,SPST	1
3200-0066	SWI,VEETRONICS,12V-14V BULB	44
3200-0081	SWI,C&K,DPDT,1201-M2-ABE2	6
3200-0090	SWI,CKT BRKR,10A,P&B W28XQ1A10	1
3200-0093	SWI,VEETRONIX,BI-LED	6
3200-0100	SWI,ROCKER,4TERM DPST NONLITED	1
3500-0873	KYCP,VEETRONIX,.600 SQ BLANK	20
3500-0874	KYCP,VEETRONIX,.687 SQ BLANK	30

Part Number	Description	Qty. per system
8900-0247	FAB,A51 DISK DRIVE COVER	1 (option)
8900-0248	FAB,A51 DISK DRIVE TRAY	1 (option)
8900-0904	FAB,3U BEZEL,DOOR POWER SWITCH	1
8900-0932	FAB,8100,TOP	1
8900-0933	FAB,8100,STIFFENER,PCB	2
8900-0934	FAB,8100,BATTERY BRACKET	1
8900-0935	FAB,8100,PCB HANDLE	1
8900-0936	FAB,8100,PSU MTG PLATE	1
8900-0942	FAB,BEZEL,4U CHASSIS	1
8900-0956	FAB,8100,PCB INS/EXTR	1
8900-0976	FAB,8100,BLANK INPUT PLATE	1
8900-0977	FAB,8100,RACK EAR,RIGHT	1
8900-0983	FAB,8100,REAR BRACKET	2
8900-0987	FAB,SHIELD BEZEL,4U CHAS	1
8900-1023	FAB,8100,FACIA 4U,2 LED,NO MED	1
8900-1026	FAB,BRKT,BEZEL INDICATOR LIGHT	1
8900-1053	FAB,8100,RACK EAR,LEFT	1
8901-0116	LABEL,8100,C/P LEGEND SET	3
9000-0081	CBL ASSY,A51 DISK EXTERNAL	1 (option)
9000-0171	CBLASSY,RS422,33FT,DB9M-DB9M	1
9000-0488	CBLASSY,8100,A/C HARNESS	1
9000-0489	CBLASSY,8100,D/C HARNESS	1
9000-0513	CBLASSY,8100,FAN	1
9000-0514	CBLASSY,8100 BATTERY	1
9000-0526	CBLASSY,8100,CP,CHE ROT ENC	4
9000-0527	CBLASSY,8100,CP,CHE DISPKBD R	1

Part Number	Description	Qty. per system
9000-0528	CBLASSY,8100,A/C INPUT HARNESS	1
9000-0529	CBLASSY,8100,POWER FAIL	1
9000-0561	CBLASSY,8100,CP TO CHAS 50FT	1 (option)
9000-0563	CBLASSY,8100,CP,CHE DISPKBD L	1
9000-0571	CBLASSY,8100,CP TO CHAS 100FT	1 (option)
9000-0572	CBLASSY,8100,EXT FD CHAS INT	1 (option)
9000-0574	CBLASSY,8100,BEZEL STATUS	1
9000-0595	CBLASSY,8100,0VDC TO TERM BLK	1
9000-0596	CBLASSY,8100,+5VDC TO TERM BLK	1
9000-0598	CBLASSY,8100,SWITCH BD STATUS	1
9100-0204	DOC,8100,OPERATIONS MANUAL	1
9100-0212	DOC,8100,TECHNICAL GUIDE	1
9400-0517	ASSY,SIMM,SRAM,256KX32,20NS	1
9400-0578	ASSY,8100,C/P VEETRONIX KBD	1
9400-0580	ASSY,8100,C/P DISPLAY	2
9400-0628	ASSY,8100,MOTHERBOARD	1
9400-0631	ASSY,8100,601 SERIAL OUTPUT	1
9400-0634	ASSY,8100,SWITCHER	1
9400-0645	ASSY,8100,C/P CPU	1
9400-0646	ASSY,8100,CHERRY	1
9400-0648	ASSY,8100,CLR CRCT SUB BOARD	1 (option)
9400-0649	ASSY,8100,FRAMESTORE SUB	1 (option)
9400-0656	ASSY,5100,DVE MAIN BOARD	1 (option)
9400-0658	ASSY,5100,SIMM,FRAME BUFFER (DVE board subassembly)	1

Part Number	Description	Qty. per system
9400-0659	ASSY,5100,SIMM,LINE DELAY (DVE board subassembly)	1
9400-0660	ASSY,5100,SIMM,DSP RAM (DVE board subassembly)	1
9400-0661	ASSY,5100,SIMM,COEFFICIENT #1 (DVE board subassembly)	1
9400-0662	ASSY,5100,SIMM,COEFFICIENT #2 (DVE board subassembly)	1
9400-0663	ASSY,5100,SIMM,DSP ROM (DVE board subassembly)	1
9400-0667	ASSY,8100,ANALOG CMPNT 8B I/P	option
9400-0669	ASSY,8100,601 PARALLEL INPUT	option
9400-0673	ASSY,8100,TALLY	1
9400-0675	ASSY,8100,INPUT (GENNUM)	2 (+ options)
9400-0681	ASSY,8100,ADV,WIPE SUB	1 (option)
9400-0696	ASSY,8100,ANLG CMPST I/P	option
9400-0702	ASSY,5100,ADDRESS GEN WARP (DVE board subassembly)	1
9400-0706	ASSY,8100,ASIC DELAYSTIK	20 (+ options)
9400-0708	ASSY,8100,STD WIPE SUB	1
9400-0716	ASSY,8100,BEZEL STATUS 3 LED	1
9400-0722	ASSY,8100,ANLG CMPNT 10B I/P	option
9400-0731	ASSY,8100,CCR BYPASS SUB BD	1
9400-0740	ASSY,SIMM,5VFLASH,2MEG,120NS	1
9400-0741	ASSY,SIMM,5VFLASH,4MEG,120NS	1
9400-0748	ASSY,8100,AUX 3,4 OUTPUT	1 (option)
9400-0762	ASSY,8100,CPU SUPERCHARGER	1 (option)
9400-0767	ASSY,8100,601 MAIN O/P ENH (FR DELAY)	1

Part Number	Description	Qty. per system
9500-0197	MECH,8100,FRONT PANEL	1
9500-0198	MECH,8100,CONTROL PANEL	1
9500-0199	MECH,8100,C/P, BOTTOM	1
9500-0200	MECH,8100,C/P, TOP	1
9500-0201	MECH,8100,JOYSTICK ASSY	1
9500-0202	MECH,8100,FADER ARM	1
9500-0204	MECH,8100,EXT FLOPPY DISK	1 (option)
9500-0241	MECH,8150,POWER SUPPLY TRAY	1
9500-0247	MECH,8150,CHASSIS FAN ASSY	1
9500-0248	MECH,8100,MAIN BD W/SIMM/RAM (includes 9400-0634, 9400-0517, 9400-0706, and 9400-0741)	1